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TRANSPLANTATION OF THE URETERS INTO THE RECTUM

With a Report of Five Cases

BY FRANK H. LAHEY, M.D.*

TRANSPLANTATION of the ureters into the rectum is a valuable surgical procedure, and for the development of the technical method whereby the ureters are implanted either at one or two sittings beneath the mucosa into the rectum, so that a protecting valve is produced, we are indebted to Dr. R. C. Coffey of Portland, Oregon. Dr. Coffey has developed procedures and demonstrated methods in ureter transplantation which have made it an operation which can be done with very reasonable safety and with assurance to the patient that the rectum will function very satisfactorily as a substitute for the bladder itself, and with but little likelihood of an ascending kidney infection.

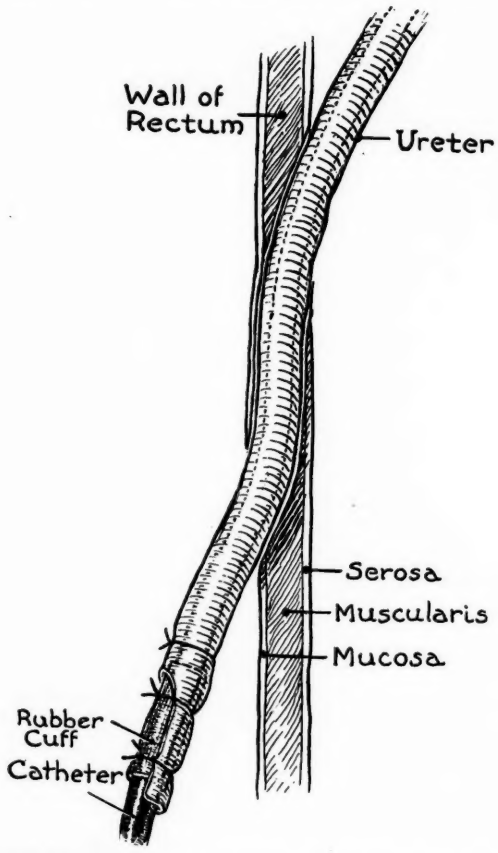

ILLUSTRATION NO. I. Showing diagrammatically the submucous implantation of the ureter in the rectal wall and the indwelling ureter catheter passed to the kidney pelvis, tied into the ureter and passing out of the rectum through the anus. This catheter comes away usually on the sixth to seventh day.

The discovery and development of this method by Dr. Coffey offers relief from suffering in certain cases and possibilities of cure in other cases, such as malignancy of the bladder. Surgery and mankind owe Dr. Coffey a debt of gratitude for originating the valuable procedure and I am glad of the opportunity to express here my appreciation to him.

It is not the purpose of this report to describe the operative steps of the procedure. This has been well done several times by Dr. Coffey, and his descriptions are available for anyone who wishes information on the subject.

For the purpose of clearness, however, two line illustrations are included to show the two most important contributions which Dr. Coffey has made in the technic of this operation.

Illustration No. I,—submucous implantation of ureters.

Illustration No. II,—catheters tied in ureters and implanted.

Three cases are here reported also, in brief, in which we have transplanted ureters into the rectum, with follow-up notes as to their condition and their urination habits now respectively twenty-two months and nine months and five weeks after transplanting the ureters.

The first patient in whom this operation was done was a woman of forty-eight years in whom Dr. James B. Hicks of the Urological Department of the Clinic discovered an early carcinoma of the bladder following the passing of blood in the urine. Dr. Hicks reported this to be an early lesion and one that offered a good prospect of cure if the bladder could be completely removed. Accordingly on January eighth, 1931 both ureters were transplanted into the rectum at one sitting, with tubes in the ureters after the method of Coffey. The transplantation was successful and at the end of six weeks during which time the patient suffered no inconvenience from the substitution of her rectum for her bladder, her abdomen was reopened and her bladder entirely removed, together with all of her urethra. She has remained well, free from any recurrence of the cancer which was in her bladder, and entirely happy, with all of her urine being dis-

*Lahey—Surgeon-in-Chief to New England Baptist Hospital. For record and address of author see "This Week's Issue," page 914.

charged into her rectum. She reports that she voids an average of four to five times a day. She reports that she knows when her rectum is full of urine and answers the impulse to empty it just as she did her bladder when it was the urinary reservoir. She never leaks urine from her rectum, and suffers no inconvenience whatever from her rectum serving her as a urinary reservoir in place of her bladder. She is employed at the New England Deaconess Hospital and has attended to her occupation there regularly since recovering from the operation.

The second successful ureter transplantation was in a patient who had a tuberculous cystitis secondary to tuberculosis of the left kidney. In 1917 her left kidney was removed and her tuberculous cystitis gradually improved, but was followed by scarring and contraction of the bladder as the result of the healing, until the bladder capacity of the patient when first examined by Dr. Hicks was but thirty c.c. It was necessary for the patient to pass her water about every fifteen minutes day and night and she had not had a complete night's sleep for a number of years.

Investigation of the remaining ureter and kidney by Dr. Hicks demonstrated them to be non-tuberculous and accordingly on February eighteenth 1931, the remaining ureter was transplanted into the rectum submucously with an indwelling tube by the method of Coffey. The recovery was entirely satisfactory. All urine is now passed by rectum and as in the previous case the substitution of the rectum for the urinary bladder has caused this patient no inconvenience whatever. She now reports that she passes her water three to four times a day and once at night. She knows by the sensation when her rectum is filled with urine, and urine has never leaked from the anus.

The third case in which we have transplanted the ureters left the hospital in November, 1931. She is an Albanian woman of thirty-six years who a few years ago, following the birth of her child in Albania, developed a very large vesico-vaginal fistula. Attempts to repair this by four plastic operations in Albania were all failures. An examination of her bladder under direct vision with the vagina distended, a lighted cystoscope in the bladder and the vagina illuminated by a light, shows almost complete loss of the entire base of the bladder.

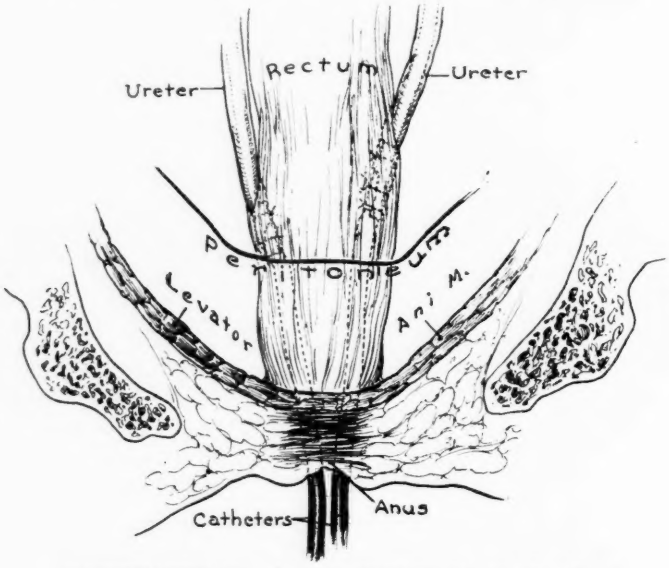

ILLUSTRATION NO. II. This diagrammatic drawing shows the relative positions of the transplanted ureters, the indwelling ureter catheters passed to the kidney pelvis and emerging through the rectum out of the anus, through which the urine drains until the catheters come loose, are pulled out and urine passes into the rectum.

It was evident in this case that a plastic repair would be almost certain to fail due to the extent of the defect, the height of the fistula and the scar tissue about it following the previous operation.

On November fourth, 1931 both ureters were transplanted into the rectum simultaneously with the indwelling catheters as described by Dr. Coffey, and the patient is now passing all urine comfortably by rectum, controls her water without difficulty and now remains entirely well. She voids three to four times during the day, once at night and apparently her rectum functions quite as well as a urinary reservoir as did her bladder.

Bilateral ureter transplantation in one stage has been done on two other patients, one of whom died on the ninth day, at which time the tubes were out of the ureters, all urine was passed by rectum without difficulty and autopsy showed death to have been due entirely to a lobar pneumonia, with a perfect healing of the ureters into the rectum without leakage and without

peritonitis. This was a case of inoperable cancer of the bladder.

In a fourth case, both ureters were successfully transplanted into the rectum at one stage, with entirely satisfactory substitution of the rectum as the urinary reservoir in place of the bladder. There was no leakage and urine was passed quite satisfactorily by rectum as by bladder. This patient succumbed four weeks later to the effects of an extensive operative procedure involving combined hysterectomy and total cystectomy, necessitated by the fact that although there were no glandular metastases, the carcinoma had eroded the back wall of the bladder and invaded the front wall of the uterus.

Inspection of the ureter implantations at the second time the abdomen was opened showed perfect healing of the ureters into the rectum, and throughout the interval between the ureter implantation and the secondary removal of the uterus and bladder, no unsatisfactory symptoms appeared as the result of all urine being passed into the rectum.

After watching the recovery and the later course in the three surviving patients after the operation, one cannot fail to be impressed with the fact that it is a most satisfactory and feasible procedure, and that there is practically no inconvenience from all of the urine being passed into the rectum.

It is now so technically feasible and reasonably safe that any patient with an early malignant lesion of the bladder should have ureter transplantation and total cystectomy. Ureter transplantation should be considered as possibly advisable also in any of the following conditions: exstrophy of the bladder (most plastic operations on this condition are far less satisfactory than ureter implantation); extensive vesicovaginal fistulae which cannot be closed by direct operative procedures; incontinence of the urinary sphincter which is not relieved by operative procedures; old contracted urinary bladders following healed tubercular cystitis; intractable and contracted bladders following Hunner's ulcer; and occasionally in hopeless extensive bleeding and painful malignancy of the bladder to divert the urinary stream and provide the patient with relief from insufferable pain.

CONCLUSIONS

Technically, bilateral transplantation of the ureters at one sitting with indwelling tubes is a satisfactory and reasonably safe procedure.

The rectum serves as a very satisfactory substitute for the urinary bladder both as to the matter of storage and warning as to emptying time.

Total removal of the bladder following transplantation of both ureters into the rectum is not a difficult operation in the female particularly and makes cure of carcinoma of the bladder possible when it can be diagnosed early.

Transplantation of the ureters offers the opportunity to relieve many patients with other troublesome lesions of either pain or inconvenience from urinary leakage by substituting the rectum for the bladder as a urinary reservoir.

PROBLEMS AND OPPORTUNITIES IN PUBLIC HEALTH AND THE RELATION OF PRACTICING PHYSICIANS THERETO*

BY STANLEY H. OSBORN, M.D.†

I DEEM it no small honor to be requested to address the William Harvey Society and trust that I shall be able to furnish something of interest to the members. If there are any present who would like to discuss any phases of public health with me after the lecture, I shall be glad to do so.

As I understand it, the William Harvey Society consists of the student body of Tufts College Medical School and as such you are interested in public health from, possibly, the two phases suggested by the title of this talk of mine, "Problems and Opportunities in Public Health." A short paper of this kind can, of course, touch only on the high points, and I am going to consider the problems from the points of view of the practicing physician and the trained public health physician.

Let us first consider the problems in public health. In discussing these, I am doing so not from the standpoint of a professor in public health or a scientific investigator, but from the viewpoint of an administrator in public health and more particularly from the point of view of the state.

It was fifty years ago that the State governments began to realize the necessity of supervising or coördinating in some way the health activities of the state in order to utilize the knowledge then available to handle contagious and infectious diseases and to control odors and unsightly nuisances. Subsequently, as additional facts were discovered, various activities were added to the functions of State boards of health, until today we have not only bureaus of preventable diseases, sanitation and vital statistics, but sanitary engineering, public health nursing, child hygiene, public health instruction and nutrition, occupational diseases, mental hygiene, school hygiene, adult hygiene, laborato-

*Delivered before the William Harvey Society in Boston, February 12, 1932.

†Osborn—State Commissioner of Health of Connecticut 1922. For record and address of author see "This Week's Issue," page 914.

ries, dental hygiene and venereal diseases. The boards of health in those early days had their difficulties in educating the public to newer advances in the control of disease, such as in the case of the germ causation of certain of them. Soon there appeared vaccines, antitoxins and various sera, beginning the era of preventive medicine. The public was not alone in the need of education, for even though diphtheria antitoxin was in fairly general use by 1900, there are physicians today,—though I am happy to say, very few,—who do not use antitoxin in treating diphtheria, and who fail to see any value in the use of toxin-antitoxin or toxoid for immunizing purposes. They are the laggards in medicine.

We know that physicians as a group are anxious to use all the modern approved methods of preventive medicine. On the other hand there are individual physicians who are lagging or stubbornly or persistently ignorant, or who are simply set in their ways and will not use modern methods in the treatment or prevention of disease; nor will they honestly try to learn new methods.

The big problem facing the recent graduate in medicine or the progressive and up-to-date physician is how to use the knowledge he has for the benefit of his patients. He has, on the one hand, the health officials, who are urging him to do more preventive work and, on the other hand, he is faced with so-called medical ethics that he feels prevent him from urging his patients to submit to preventive procedures; yet we know that the term "medical ethics" is often falsely employed. Most patients accept a physician's advice and submit to his recommendations. A few patients, a small minority, naturally feel that the physician who urges certain procedures in preventive medicine is doing so in an effort to increase his income. It is my belief that the general practitioner today faces extinction unless he is willing to adopt simple activities in preventive medicine such as urging his patients to undergo periodic physical examinations and immunization against certain diseases, giving information in regard to the safest milk supplies, and advising in regard to the health of a family preparing for vacation. These are but a few of the things he might do. If he really considers himself the physician of a family, he owes it to the members of the family to notify them of certain preventive procedures they should employ. He should not wait for a call to come only when a member of the family is ill. If this spirit of willingness to teach can be adopted by physicians, there will be little occasion to fear the bogey of "State medicine" that seems to be constantly hovering on the horizon.

Please do not misunderstand me. I do not mean that physicians should advertise or obnoxiously impose themselves on a family. I merely want to suggest to the general practitioner that if he considers himself a physician to a certain family, if he attends the pregnant mother, if he is the one called for when the family has a member ill, then he should recommend certain measures in preventive medicine.

For instance, he could very easily, at the time when a child is born, urge the mother to have that child protected against diphtheria and smallpox at the age of six months. He could do this with as much propriety as he prescribes a certain diet for the infant or orders cod liver oil. He should remind the family, when the infant reaches the age of six months, that the time has arrived to employ these immunization treatments; he should not wait to be called to the family when the child has diphtheria and then say, "It is too bad you did not have the child immunized against diphtheria!" I fully understand that children of school age in some towns and cities are immunized at public expense, but the physician must remember that nearly a third of the cases of diphtheria are in children below the school age; hence he should not permit the parents to wait until that time has arrived. Continued mass immunization of school children is a reflection on the intelligence of parents and on our ability to educate and impart knowledge to parents concerning the value of preventive medicine.

Similarly, we can urge periodic physical examinations and other procedures. The practicing physician is faced with this so-called public health problem, which is really his affair, and which he should solve, in my opinion. If he will but act, it does not remain a public health problem. If physicians do not carry out these preventive measures, some of which are being conducted in our larger cities as public health activities, a certain proportion of the public will demand that they be done by the health officials everywhere. The public in general do want to be helped to keep well even though it is difficult for them to do so of their own volition.

The matters for solution by public health officials include not only the education of the laity but, in addition, the task of imparting newer knowledge to the medical profession. Necessarily, health officials are primarily concerned with diseases that are communicable and preventable although in recent years knowledge of such affections as heart disease and cancer, assailing large numbers of the population, is being imparted to the public. I believe that Doctor Bigelow, your State Commissioner of Public Health, spoke to you last year on adult hygiene, so you have an idea of the work of departments of health along that line of endeavor.

The public health officials have many duties, some of them of an administrative, routine nature and others of an investigative character.

For instance, the control of communicable diseases rests on the reports of disease that physicians make to the local boards of health, and which those boards in turn forward to the State department of health. The majority of physicians report cases of reportable diseases as they occur. The few who do not forward complete reports are the cause, occasionally, of far-reaching spread of disease.

Physicians are given a certain number of days to report the births that they attend. A delay often occurs and in certain rare cases the report is never made, due to the forgetfulness of the physician. Thus the child has no birth certificate and cannot get a copy of one when he desires it to enter school or to get working papers. This causes a great deal of unnecessary trouble for the parents and we can imagine what they think of such neglect on the part of the physician.

It is, however, fortunate that health officers do receive the greatest coöperation from the large majority of physicians in the reporting of disease, deaths and births. It is the prompt reporting of diseases that gives health officials some chance to cope with budding outbreaks early in the course of a possible epidemic and the impending danger without a doubt is often prevented. Of course we have no way of telling when this happens except by sad experience when all measures fail and the epidemic does occur.

Public health officials try to and should work in closest partnership with physicians. The public health laboratory, for example, offers its services in examining and reporting on various material forwarded by the practicing physicians. The officials seek to aid in the diagnosis of unusual types of communicable disease and puzzling illnesses; they try to be of assistance in outbreaks of disease, such as the poliomyelitis outbreak that raged during the past fall. The laboratories of health departments strive to aid the physician in locating the source of infection in many diseases, such as the possible carrier in typhoid fever or the polluted water, milk or contaminated food that may have caused typhoid, paratyphoid or gastro-intestinal illness. This effort to find the source of infection is made to avoid another outbreak from the same source. For example, health authorities try to have physicians forward specimens of blood, feces and urine from all the members of a household when a typhoid fever case occurs, in order to locate the possible carrier. Usually, the family physician helps; occasionally he shrugs his shoulders and replies that it is not his job; yet he considers himself the family physician. He should, of course, have carried out these procedures, or at least coöperated with the health authorities as a duty he owes to the family. I mention these specific instances to show how the family doctor is missing his opportunities and how the job then becomes a problem of the health officer because of the neglect of the physician. I have great hopes that the present depression may give the physician an opportunity, as he sits in his office chair, to reflect on these wasted opportunities if such are recalled and, as he reflects, that he may be brought to realize that the public expects someone to do these things—and no one is better fitted for this than the physician.

The problems in public health are not all linked with the medical profession. The departments of health have their difficulties along the line of communicable diseases, such as poliomyelitis, undulant fever, psittacosis, tuberculosis, tularemia and even tuberculosis, to mention only a few.

In the case of poliomyelitis, we have a disease against which the public is demanding action on the part of the boards of health. However, the boards of health are fully aware of the known facts and try to take precautions consistent with their knowledge. Still, the public demands that more should be done and many humorous suggestions are received.

We have undulant fever, produced by organisms that are present in hogs, cows and goats. Shall health officials stop the sale of all milk until all the cows are shown to be free of the disease, and shall we stop the raising of hogs in areas where the infection exists, or shall we wait until we locate the exact cause, means of recognition of the organism and the infection, and then act on the facts found? Obviously, we must inform the public and through the spread of knowledge gain the desired end. And yet, the information must be sane and so issued as not to cause unnecessary hardship or hysteria.

No sooner was psittacosis reported prevalent, two years ago, than a well-intentioned individual tried to have a state law passed requiring all parrots to be licensed. Since then we have had cases of the disease spread by parrakeets, love birds and canaries; presumably the gentleman would want these birds licensed also. Just imagine the health authorities going through the procedure of licensing parrots each year, for some parrots, as you know, live as long as the average human being. Yet psittacosis is a disease which health authorities must consider and they have attempted to institute procedures which should prevent any further widespread outbreaks of the disease and still discommode the usual routine of parrots and human beings as little as possible.

The control of tularemia, spread to human beings by diseased rabbits, is a problem that is most interesting. This disease was first recognized in the western states and has now spread

to all states except a few in New England, through means of rabbit shipments.

Even Rocky Mountain fever, a disease thought to be present only in the states of the northern section of the Rocky Mountains, has been shown by studies of the United States Public Health Service to occur, apparently, in the eastern states as well, where it is spread by the dog tick.

These new problems are constantly arising, even though many times we believe we know all the facts. A few years ago no one connected Malta fever and undulant fever until laboratory research and epidemiological study showed the relationship of brucelliasis in the goat, hog, cow and man. I well remember cases of illness that were, according to the symptoms, Malta fever, and yet because we could find no history of the patients partaking of goats' milk, the illnesses were classified as unknown fevers. Similarly, we have had cases of typhus fever in households that had no lice, bedbugs or other vermin, so far as we could ascertain, and it was not until additional study brought forth the apparent existence of two types of typhus fever, one of which is apparently louse-borne and the other spread by the rat flea, that we could make the diagnosis.

Thus in discussion of the problems of public health we uncover the many chances for opportunity for the trained mind, for the inquisitive soul, for the adventurer in striving to find the reason for many of the lacking links in the chain necessary for us to have a better knowledge of the spread and control of disease.

Other matters for consideration come up in many public health fields, aside from communicable diseases. We have the great problems of maternal and infant mortality. What is the best way to combat these? Obviously, if the people can be educated to the desirability of prenatal care and advice, if mothers can be taught the essentials of proper nutrition, the desirable methods of child care, both medical and dental, this question will be answered to a certain extent. Who can reach the parents in the State? Boards of health and other organizations can furnish pamphlets of information, but the practicing physician is the man, if he but realized it, who can insist that certain necessary things must be done. To do this, he must acquire knowledge and that is not always easy today for the tired practitioner at the end of the day's labor. However, the physician in some way must keep up with the times or fall by the wayside. He must put aside some minutes during his busy day during which to read his medical journals. This problem is his as much as the public health authorities and, indeed, if he would do it, his patients would be grateful and there would be fewer perplexing points for the health officials.

It is my desire, in bringing forth these ideas concerning the physician, to show how public health officials are closely allied to the physician, and both are indeed a coöperating group, working for a common end.

The problem of industrial hygiene and occupational diseases is one that is already prominent. I do not mean to suggest anything as included in the term *industrial hygiene* that concerns accidents from machinery in any way. The common cold in industry has received an enormous amount of study and the problems incident thereto are as yet unsolved. All sorts of poisonings occur in industrial plants, from conjunctivitis due to fumes, to metallic poisonings from lead, gold and mercury. There have been hundreds of cases of allergic poisoning due to finely ground vegetable dust, and of course, injuries from acids and alkalies—all are common causes of disease. The field of opportunity here is wide.

Mental hygiene, also, as a public health problem is just being understood and the demand for properly trained psychiatrists exceeds the supply many fold.

In general, the public at large often leaves the matter of public health, with all its ramifications, to the health officer, and often it is rather discouraging to find but a few people here and there in a community who are willing to give their time toward furthering support for public health measures.

Frequently this difficulty of acquiring local support is due to the neglect of the health official and to his failure to utilize the important branch of public health called public health education or instruction, carried on by such means as the printed pamphlet, lectures, moving pictures, exhibits and the radio.

The health officer has valuable aids in the press and a nucleus of a few interested lay persons greatly assists him to present his side of the case in such a way that public health progress is much easier to make today than ever before. There are problems of department policy, arrangement of the budget, the proportion of the personnel allotted to different phases of department work and others that could be discussed, but time will not permit.

Never before in the history of the world have people known so much about the physical side of themselves. Many persons with chronic ailments have read books, seeking knowledge in regard to their condition. Other patients secure gratuitous advice from the press about their pet ailments, from corns to why the family physician does not diathermize the tonsils rather than ectomizing them. Of course, they cannot understand all they read in the press columns. We are made aware, however, that many are reading about medicine and listening in on radio health talks. Thus the public is

ready to listen to the physician in public health whose duty it is to impart such knowledge as he believes will be of service to the community.

But time is passing. I want to discuss the opportunities in public health as a means of livelihood and service to the community. The health officer has the problem of trying to make the community public health conscious. He also endeavors to offset the barrier of antagonism that so often exists in the minds of some persons because medicine cannot cure one hundred per cent of our patients.

There are many ways of entering into public health activities, but it should not be done without discussing public health with someone capable of giving good advice. The average physician of the past, trained particularly in the curative and pathological side of medicine and not thinking particularly of preventive medicine, naturally has difficulty in appreciating all phases of public health.

There are those in the past who just drifted into it. Usually a physician is appointed a member of a board of health or a school physician and sooner or later he may become a part-time employee of a town, city or state, or even accept a full-time appointment. As the years pass by, he gains experience and many such physicians become authorities in this field of public health because of their ability, experience and urge to do more. At the present time, it is only the rare physician who can step into the position of health officer without special training, for public health is truly a specialty just as is any other branch of medicine. It seems to be true that in the professional field failure is in the offing for many of those who enter a profession merely from a monetary standpoint. It is rather the rule that physicians in a community will coöperate with a trained medical health officer better than with an untrained physician who may try to take up the reins of public health with no qualifications.

Today there is no need of a physician spending many years gaining knowledge in public health through sad years of experience. Instead, any physician who desires to enter the public health field can prepare himself by taking one of the courses in public health offered at several colleges of the country. These courses are open to physicians and usually lead to degrees of Master of Public Health, Certificate of Public Health, or Diploma of Public Health, depending on the university, in one year, and the degree of Doctor of Public Health in two years.

A public health degree is practically essential for a physician who is planning to make public health his life work. It emphasizes the fact that in public health special training is necessary; it stresses the fact that public health is a specialty in medicine; and it acts as a deterrent to untrained persons who may desire the position occupied by a trained man. In taking such a course, a person can fit himself to be a health officer, or he may prepare to do laboratory research work, school health work, industrial hygiene, mental hygiene or some other phase of public health that appeals to him. He can spend one year or two years or more as his inclination guides him or his finances permit.

On the completion of the public health course he will have several opportunities presented to him, if the present demand for trained physicians continues, for the need for trained men is imperative and the opportunities presented are in many lines. He may be offered a position in a large department of health in a subordinate capacity. Undoubtedly the latter is most desirable in order that he may round out his theoretical training with a year or two under the guidance and supervision of some other physician with years of experience, from whom he will gain much valuable knowledge of the diplomacy, tact and administrative procedures that go with a career in public health.

Particularly fortunate is the young man starting in who has the advantage of a few years working at the shoulders of a group of experienced men. He can see how they do things, perceive their failures, mistakes and experiences, and gain a mass of information that should stand him in good stead in the future.

As salaries go, the physician who enters the public health field will never be a rich man, but he will enter a work in which he is in contact with all kinds of people in the community. For this reason the physician who has difficulty in meeting people will find such a position embarrassing unless he overcomes this handicap. The cloistered individual had better become a research man, such as a laboratory specialist, where he can work in an atmosphere he will enjoy. I do not mean, however, that all laboratory workers are cloistered.

The field of public health is wide open to the energetic physician who has a good personality, tact, discretion, diplomacy and is scrupulously honest in his dealings with his fellow men. As a public official, he cannot show any favoritism. All must be treated alike or he will soon be looking for another job. He must not overlook the fact that he is a public official and a servant of the public. The health officer is in the full glare of the public eye, compared with the average physician, and thus must shape his actions in such a way that there is no suspicion of wrong conduct, public or private, and particularly of his ethical activities. His job should be a full-time service and if so, he should not do any private practice. Of course the part-time health officer has to be particularly careful in these matters.

The uncertainty of tenure of office, however, has been one of the drawbacks in the past, to

many who otherwise might have entered public service. In recent years there has been a distinct tendency to keep in office the medical health officer who has made good, and periodic advances in salary have been customary in many cases.

The United States Public Health Service is, possibly, the most likely to attract young physicians for it offers a varied line of activity, including marine hospital work, with regular advances at stated intervals as physicians pass the examinations for the next promotion. In addition, once a commissioned officer, he can remain for life unless charges are brought against him, and when he reaches the retirement age, he is pensioned with reasonable income.

In State health work, some states have the personnel under civil service while others do not, so that a physician in the latter states may be subject to the whims of his superior. However, most State departments of health select their personnel with care and it is more or less rare for anyone in this part of the country to be discharged without cause.

As health officer of a city, the physician may become a mark for many kinds of criticism, but here again in this section of the country it is fairly well recognized that a health official who has given good service is not to be disturbed by anything of a minor nature. In addition, there are many unofficial agencies, such as the Rockefeller Foundation, the Commonwealth Fund, the American Child Health Association, and other national, state and local health groups, that are constantly seeking the service of trained public health workers.

We may sum up, then, this brief discussion by stating that many old problems in public health still exist; that many new problems are constantly arising; that the opportunities in public health cover a most interesting field of endeavor and most of them are peculiarly allied to physicians, and that financial opportunities are more than sufficient to interest the physician who enjoys the field of activity offered by public health service, who possesses a spirit of unselfishness and unconsciously desires to do something for the benefit of his fellow man and the community in which he lives.

REPORTED GONORRHEA AND SYPHILIS IN MASSACHUSETTS IN 1931

BY N. A. NELSON, M.D.,* AND GAYLORD W. ANDERSON, M.D.*

THIS is the second year in which gonorrhea and syphilis have been reported, on modified forms, directly to the State Department of Public Health.

While little may be learned from the reports as to the actual increase or decrease in prevalence (since reporting is still so incomplete that gross variations have little identifiable significance), they do have a very considerable value for certain types of analysis. That certain factors (such as age group prevalence, stage of the disease and distribution by sex) may be expressed in percentages which from year to year remain almost constant, must have some real significance, not only in relation to the smaller, reported group, but in their projection upon the whole. These constants also give greater significance to other factors which, though variable, may be evidence of trends.

Consequently it is encouraging to discover that 1092 physicians reported one or both diseases in 1931 as compared with 1081 in 1930, and that although no reports were received from 408 physicians who reported last year, 419 new names were added to the list this year, a net gain of 11. Further, since the loss and replacement were entirely within the group of those who reported only one or two cases, at least 90% of the cases each year were reported by a constant group of physicians. For the purpose of eventually providing an intensive information service for those who are known to treat gonorrhea and syphilis, the Department can identify 1499 physicians who have reported these diseases during the past two years. They represent about 26% of the practicing physicians in the State.

In 1931, the 1092 physicians, together with 26 public clinics and about 100 hospitals and institutions, reported 7201 cases of gonorrhea and 4447 cases of syphilis, gains over 1930 of 227 cases of gonorrhea and 250 cases of syphilis. These do not include 81 cases of gonorrhea and 64 cases of syphilis reported as in non-residents of Massachusetts.

The proportion of all physicians in the State reporting gonorrhea remains, as in 1930, at just over 15%, while that of physicians reporting syphilis has increased from 8.1% to 8.9%.

Physicians reported 53% of the gonorrhea, clinics 40% and institutions 7%; physicians reported 26% of the syphilis, clinics 60% and institutions 14%. Thus, outside of institutions, patients who were free to choose between physician and clinic went to the former for treatment of gonorrhea in 57% of cases and of syphilis in 30%. But as it was pointed out in last year's study[1], while clinics report practically all of their cases, many physicians do not report at all, and others do not report all of their cases. The various surveys made throughout

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the United States as summarized by Parran[2] show that more than 80% of the cases of gonorrhea and nearly 60% of the cases of syphilis under medical care, are being treated by physicians in their private practices.

It is discouraging to note that this year only 44.6% of the 355 physicians receiving arsenicals free from the State reported syphilis (47.2% of 316 in 1930)!

RESIDENCE OF PATIENTS

In 1929, under the old, complicated system of reporting directly to local boards of health, only 98 of the 355 cities and towns in the State appeared to have any cases. In 1930, under the new system, cases were reported from 257 communities, and this year the number has increased to 268. Many of these communities, some of them large cities, are becoming conscious, officially, for the first time, that these diseases exist, an essential first step toward any program for their control.

While it is true that the smaller communities have by far the lower rates, there is very real evidence of greater improvement in reporting in these than in the larger cities, this year. (Table I.)

TABLE I

RESIDENCE OF PATIENTS

Size of Community	Number of Communities	Total Population	Rates per 100,000 Population			
			Gonorrhea		Syphilis	
			Rate	Gain %	Rate	Gain %
Under 10,000	281	739,122	87.8	23.3	43.3	8.7
10,000–20,000	32	464,691	107.0	19.0	53.2	13.7
20,000–50,000	25	784,440	129.4	10.7	71.8	25.7
50,000–100,000	7	517,968	120.9	16.2	77.3	15.5
100,000–150,000	6*	639,862	172.1	5.4	104.3	0.0
150,000–500,000	2	348,304	184.8	17.2†	119.3	43.8†
Boston	1	781,579	341.8	0.8	234.9	0.9
State	354	4,275,966	168.4	2.8	104.0	5.3

*Lowell included, for comparison with 1930, though population has dropped to 97,733.
†Due largely to more complete reporting by a clinic which previously had reported only acute cases. If this clinic had reported the same number of cases as last year, the gains would have been—gonorrhea 9.6% and syphilis 11.9%.

MIGRATION OF PATIENTS

Excluding the 1147 reports from institutions, 2866 patients migrated outside their communities of residence, for treatment. They represent 27.3% of the non-institutional cases as compared with 24.7% in 1930. The increase in migration was greater for syphilis (5%) than for gonorrhea (1.2%). Migration to physicians increased more rapidly than to clinics, for gonorrhea, but for syphilis the reverse is marked, there being an actual decrease over 1930 in the percentage migration to physicians. (Table II.)

In the State as a whole 935 patients with gonorrhea (54% of total migration) came to Boston for treatment, 51.7% of them to clinics and 48.3% to physicians. In 1930, 926 (60%) of the migrating gonorrhea patients came to Boston, 50.5% of them to clinics and 49.5% to physicians. This year 797 patients with syphilis (70.1% of the total migration) came to Boston for treatment, 77.8% of them to clinics and 22.2% to physicians. In 1930, 612 (68.7%) of the migrating syphilis patients came to Boston, 65.5% of them to clinics and 34.5% to physicians. Thus the proportion of migration to Boston decreased 6% for gonorrhea and increased 1.4% for syphilis but the proportion of clinic cases increased 1.2% for gonorrhea and 12.3% for syphilis.

This tendency toward an increase in clinic cases is seen also in the division between physician and clinic of all cases whether migrating or treated locally. (Table III.)

How much of this increase in clinic cases is apparent and not real is difficult to determine. Some of it may be due to the present economic situation and some of it may be due to less attention to reporting all of their cases by physicians. Certainly, since clinics report most of their cases and physicians often tend to neglect reporting, clinic gains will appear disproportionately high.

THE PATIENTS

Four times (3.75) as many males as females were reported as having gonorrhea (3.02 in 1930), and only 1.44 times as many males as females were reported as having syphilis (1.43 in 1930). In the clinics the ratio of male to female gonorrhea was 3.2 to 1 while among cases reported by physicians the ratio was 4.3 to 1. The ratio of male to female syphilis as reported by clinics was 1.4 to 1; as reported by physicians, 1.6 to 1. Except that the clinic male to female ratio in gonorrhea has risen from 2.1 to 3.2 to 1, these ratios are practically identical with those of 1930.

Among males, 66.8% of the gonorrhea and 60.5% of the primary syphilis was in single males (66.7% and 64.9% respectively in 1930).

Among females 51.1% of the gonorrhea and 52.1% of the primary syphilis was in single females (49.6% and 44.4% respectively in 1930). The greater variation in the case of syphilis may be due to the relatively small number of cases of primary syphilis reported—390 male and 98 female. The rather close agreement, however, between the percentage of gonorrhea and primary syphilis in either sex still seems to indicate that both diseases are acquired by about the same proportion according to marital state.

Again it is noted that although a higher percentage of male syphilis than female is diagnosed in the primary stage, the percentage of male and female "early" syphilis (primary and secondary) not only is essentially the same, but has varied little in the two years (Table IV).

The fact that nearly 60% of reported cases of syphilis are in the late stages of the disease is evidence of serious lack of public information concerning syphilis and perhaps of serious inadequacy of treatment of the disease in its early stages. The 7% of cases of congenital syphilis represent a situation which could be entirely avoided by the routine use of the Wassermann early in every pregnancy with subsequent antisyphilitic treatment during pregnancy of women found to have syphilis.

There continues to be close agreement between the distribution of either disease among the various age groups, both diseases being markedly predominant in youth (Tables V and VI).

TABLE II (A)

MIGRATION OF PATIENTS WITH GONORRHEA

(*Per cent of Total Cases*)

Size of Community	1930 Total Cases*	Migrated To M.D.	Migrated To Clinic	Migrated To Total	1931 Total Cases*	Migrated To M.D.	Migrated To Clinic	Migrated To Total
Under 20,000	884	38.7	17.2	55.9	1071	41.2	19.3	60.5
20,000–50,000	949	25.0	21.8	46.8	929	27.4	22.6	50.0
50,000–100,000	456	27.6	18.4	47.0	604	21.2	15.2	37.0
100,000–Over	1510	12.2	9.6	21.8	1653	12.0	8.8	20.6
Boston	2482	2.6	0.0	2.6	2436	2.2	0.0	2.2
State	6281	15.0	9.4	24.6	6693	16.1	9.7	25.8

* Institutional cases not included.

TABLE II (B)

MIGRATION OF PATIENTS WITH SYPHILIS

(*Per cent of Total Cases*)

Size of Community	1930 Total Cases*	Migrated To M.D.	Migrated To Clinic	Migrated To Total	1931 Total Cases*	Migrated To M.D.	Migrated To Clinic	Migrated To Total
Under 20,000	416	29.6	52.9	82.5	479	28.2	50.3	78.5
20,000-50,000	392	23.5	41.3	64.8	466	21.5	54.9	76.4
50,000-100,000	265	18.5	25.3	43.8	362	10.2	31.5	41.7
100,000-Over	836	7.1	13.1	20.2	911	5.8	20.3	26.1
Boston	1662	0.5	0.0	0.5	1585	1.0	0.1	1.1
State	3571	9.3	15.6	24.9	3803	8.9	21.0	29.9

* Institutional cases not included.

DIAGNOSIS OF PRIMARY SYPHILIS

The darkfield was used in the diagnosis of 43.0% of the 488 cases of primary syphilis (44.1% of 535 cases in 1930). Serology alone was depended upon in 48.5% of the cases (44.5% in 1930). In 7.0% no statement was made as to laboratory confirmation of diagnosis.

LAPSED CASES AND SOURCES OF INFECTION

There were 2968 cases reported by name (2476 in 1930). Of these, 2830 were reported as having discontinued treatment prematurely (51.4% gonorrhea and 48.6% syphilis) and 128 as "sources of infection" (68% gonorrhea and 32% syphilis). The remaining 10 were reported as "occupational hazards". These percentages agree to within 2% of those for 1930. Physicians reported only 8.6% of this total; less than in 1930 when they reported 10.2%. Clinics reported 88.0% and institutions 3.4%.

Of the patients discontinuing treatment for gonorrhea, 87.2% were males and 12.8% were females; but of the "sources of infection" only 24.2% were males while 75.8% were females. Of those discontinuing treatment for syphilis 60.1% were males and 39.9% were females; while of the "sources of infection" 57.1% were

males and 42.9% were females. There is no apparent accounting for the fact that three times as many females as males are reported as "sources of infection" of gonorrhea in spite of the fact that four times as many males as females are reported as having gonorrhea; while the male-female ratio of "sources of infection" of syphilis is 1.33 to 1—almost the same as the male-female ratio of reported cases (1.44 to 1).

Only 47.7% of the patients reported by name could be found and brought back to treatment (43.5% of those with gonorrhea and 52.4% of those with syphilis). This represents no improvement over 1930 when 47.3% were found. False names and addresses constitute a serious obstable to control. This is particularly true since gonorrhea is always communicable so long as it is gonorrhea and since 36% of the total syphilis cases reported by name were in the early and most communicable stages and 57% of them (20% of the total) were lost.

Boards of health in 148 cities and towns (109 in 1930) were engaged in the attempt to return these patients to treatment. It must be said that this is no simple task, for frequently many visits must be made before the patient can be located and returned to treatment.

TABLE III

REPORTED BY CLINICS AND PHYSICIANS

	1930 Total Cases	% Treated By M.D.	% Treated By Clinic	1931 Total Cases	% Treated By M.D.	% Treated By Clinic
Gonorrhea	6281	59.7	40.3	6693	57.3	42.7
Syphilis	3571	31.7	68.3	3803	29.8	70.2

TABLE IV

PER CENT OF SYPHILIS BY SEX AND STAGE (4439 CASES, 1931)

Sex	Year	Primary	Secondary	(Total Early)	Late	(Neuro-Syphilis)*	Congenital	All Forms
Male	(1930)	16.7	18.7	(35.4)	60.0	(16.8)	4.6	100.0
Male	(1931)	14.9	18.9	(33.8)	60.2	(13.7)	6.0	100.0
Female	(1930)	6.7	29.8	(36.5)	53.7	(6.9)	9.9	100.0
Female	(1931)	5.4	26.8	(32.2)	58.1	(6.7)	9.7	100.0
Both Sexes	(1930)	12.6	23.2	(35.8)	57.7	(12.7)	6.5	100.0
Both Sexes	(1931)	11.0	22.1	(33.1)	59.3	(10.9)	7.5	100.0

* Probably congenital.

SUMMARY

1. One thousand and ninety-two physicians, 26 clinics and 100 hospitals and institutions reported 7201 cases of gonorrhea and 4447 cases of syphilis in 1931, an increase over 1930 of 227 cases of gonorrhea and 250 cases of syphilis. During the two years in which these diseases have been reported directly to the State Department of Public Health, 1499 different physicians have reported one or both diseases, about a quarter of the physicians practising in the State.

2. Although under the old system of reporting in vogue through 1929, cases were reported from only 98 of the 355 communities in the State in the latter year, in 1930 reports were received of cases in 257 communities and in 1931, from 268.

3. The smaller communities continue to have relatively much lower case rates for both diseases, but gains over 1930 in rates have been almost entirely from the small cities and towns.

4. As between clinics and physicians, the latter reported 57.3% of the gonorrhea and 29.8% of the syphilis, a decrease over 1930 of nearly 2% in either disease. Clinics reported 42.7% of the gonorrhea and 70.2% of the syphilis, a corresponding increase over 1930. How much of this increase of clinic cases is due to the present economic situation and how much is due to a tendency on the part of physicians to neglect reporting cannot be determined.

5. Migration of patients to "out-of-town" physicians and clinics increased from 24.7% in 1930 to 27.3% in 1931. The increase in migration was greater to physicians than to clinics for gonorrhea, but there was an actual decrease in migration to physicians for syphilis. Boston physicians and clinics reported 54% of the total migrating cases of gonorrhea and 70.1% of the total migrating cases of syphilis as compared to 60% and 68.7%, respectively, in 1930.

6. The ratio of reported male to female gonorrhea is 3.75 to 1 as compared with 3.02 to 1 for 1930. The ratio of male to female syphilis is 1.44 as compared with 1.43 in 1930, disclosing the same apparent failure to discover fe-

male gonorrhea as has existed since reporting began in 1918.

7. Again this year about two-thirds of the males with gonorrhea or primary syphilis were single, while approximately half of the females with gonorrhea or primary syphilis were single. One quarter of the single females with gonorrhea, however, were under 14 years of age.

8. There is remarkable agreement in the distribution of the reported cases by stage of syphilis and by age-groups in both syphilis and gonorrhea, during the two years. As in 1930, about one-third of the cases of syphilis in either sex are "early", and two-thirds are "late" (including congenital syphilis as "late" syphilis). The percentage of the total reported as neurosyphilis is twice as great (13.7%) in males as in females (6.7%), but congenital syphilis is considerably higher in females (9.7%) than in males (6.0%).

9. The evidence consistently points to marked predominance of these diseases in the younger age-groups, with the females becoming infected much earlier than the males. Of the males with gonorrhea, 8.9% are under 20; 40.8% are under 25; and 64.6% are under 30 years of age. Of the females, 32.2% are under 20; 61.3% are under 25 and 77.7% are under 30 years of age. Of the males with early (primary and secondary) syphilis 50.3% were under 30 years of age as compared with 66.9% in females under 30 years of age.

10. The darkfield was reported as used in only 43% of the 488 cases of primary syphilis

TABLE V

PER CENT OF GONORRHEA BY SEX AND AGE (7201 Cases, 1931)

Age	Year	0-14	15-19	20-24	25-29	30-39	40-49	50 and over	Total
Male	(1930)	1.0	8.3	32.5	24.8	22.8	7.2	3.4	100.0
Male	(1931)	0.7	8.2	31.9	23.8	24.4	7.8	2.6	100.0
Female	(1930)	11.7	18.8	29.5	18.3	14.7	4.7	2.3	100.0
Female	(1931)	12.5	19.7	29.1	16.4	16.4	4.2	1.3	100.0

Note that 8.9% of males and 32.2% of females are under 20; 40.8% of males and 61.3% of females are under 25, and that 64.6% of males and 77.7% of females are under 30 years of age.

TABLE VI

PER CENT OF SYPHILIS BY AGE AND STAGE

Male (2624 cases, 1931)

Age	Year	0-14	15-19	20-24	25-29	30-39	40-49	50 and over	Total
Primary	(1930)	0.02	7.8	25.1	26.4	24.5	9.6	6.0	100.0
Primary	(1931)	0.2	5.4	24.9	22.8	30.3	11.5	4.3	100.0
Secondary	(1930)	1.1	4.8	26.8	21.9	26.7	11.8	6.9	100.0
Secondary	(1931)	0.4	3.6	22.4	21.5	30.8	15.3	5.2	100.0
Late	(1930)	0.0	1.0	4.3	8.9	25.0	27.8	33.0	100.0
Late	(1931)	0.4*	0.6*	6.0	7.0	22.3	30.8	32.6	100.0
Congenital	(1930)	67.4	13.0	10.9	6.5	2.1	0.1	0.0	100.0
Congenital	(1931)	60.0	22.9	6.4	4.5	3.8	1.2	1.2	100.0

* Probably congenital.

Note that 53.3% (59.3% in 1930) of primary syphilis and 47.9% (54.6% in 1930) of secondary syphilis, or 50.3% (56.9% in 1930) of all early syphilis in the male is in men under 30 years of age, compared with 64.6% (66.6% in 1930) of gonorrhea in males under 30 years of age. The prevalence of early syphilis in males appears to be shifting toward the higher age-groups.

Female (1815 cases, 1931)

Age	Year	0-14	15-19	20-24	25-29	30-39	40-49	50 and over	Total
Primary	(1930)	4.5	22.4	32.8	14.9	19.4	4.5	1.5	100.0
Primary	(1931)	0.0	18.4	34.7	22.5	13.2	7.1	4.1	100.0
Secondary	(1930)	0.3	12.7	31.6	20.8	20.1	8.7	5.8	100.0
Secondary	(1931)	1.1	13.1	32.3	19.0	24.3	7.5	2.6	100.0
Late	(1930)	0.0	5.3	11.4	12.7	29.2	21.1	20.3	100.0
Late	(1931)	0.7*	6.5*	12.5	10.9	26.1	24.6	18.7	100.0
Congenital	(1930)	50.3	24.2	11.0	8.0	4.0	0.5	2.0	100.0
Congenital	(1931)	62.0	16.5	10.2	4.0	6.6	1.7	0.0	100.0

* Probably congenital.

Note that 75.6% (74.6% in 1930) of primary syphilis and 65.5% (65.4% in 1930), or 66.9% (67.2% in 1930) of all early syphilis in the female is in women under 30 years of age, compared with 77.7% (78.3% in 1930) of gonorrhea in females under 30 years of age. There is no appreciable change in the age-group prevalence of either syphilis or gonorrhea in the female.

(44% of 535 cases in 1930). Serology alone confirmed the diagnosis of primary syphilis in 48.5% of the cases.

11. There were 2968 cases reported by name and address as having discontinued treatment prematurely or as "sources of infection". Physicians reported only 8.6% of these compared to 10.2% of 2476 cases in 1930, and compared with 88.0% reported by clinics and 3.4% by institutions. Of the patients discontinuing treatment for gonorrhea, 87.2% were males and 12.8% females; for syphilis, 60.1% were males and 39.9% were females. Of "sources of infection" of gonorrhea only 24.2% were males and 75.8% females; but males outnumbered females as "sources of infection" of syphilis 57.1% to 42.9%! This in spite of the fact that four times as many males as females are reported as having gonorrhea, while the male-female ratio of reported syphilis is 1.4 to 1!

12. Only 47.7% of the patients reported by name could be found (47.3% in 1930). False names and addresses constitute a serious obstacle to control. About 36% of the syphilis cases lapsing treatment were "early" and 57% of these could not be found. Nearly 60% of the cases of gonorrhea could not be found.

13. Boards of health in 148 communities (109 in 1930) were engaged in the follow-up of these 2968 cases.

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ACUTE ANTERIOR POLIOMYELITIS*

Treatment of Bulbar and High Spinal Types

BY JAMES L. WILSON, M.D.†

DEATH from poliomyelitis seems for the most part to be due to a primary respiratory failure; that is, to direct disturbances of the mechanism of respiration itself. The last few years have not passed without some increase in our ability to treat symptomatically these types of poliomyelitis that so often result in death. In the past two years we have treated in the Children's Hospital about 60 patients suffering from poliomyelitis who have experienced respiratory disturbances, and 43 of whom had difficulties so severe that we have resorted to the use of the Drinker respirator in an effort to relieve them. In spite of the variable and bizarre symptomatology of the disease, fatal cases always show pathologically a surprisingly generalized involvement of the cord and medulla. The results of isolated lesions which can be detected clinically must be explained by unpredictable variations of the intensity of the pathological process at slightly separated anatomical points,—variations which are usually not demonstrable histologically. We believe it has been possible clinically, however, to distinguish in this group of patients three mechanisms by which respiratory failure has been brought about:

(I) A direct paralysis of the primary respiratory muscles, i.e., those muscles dependent on involvement of the dorsal and cervical spinal cord, the intercostal muscles or the diaphragm.

(II) Interference with respiration occurring in patients with pharyngeal paralysis in whom inspiration is continually interrupted by unswallowed secretions collecting around the glottis.

(III) A disturbance of the nerve centers in the medulla controlling respiration.

Since the word "bulbar" is so commonly used in discussing patients with respiratory failure, it is well to emphasize the fact that the first mechanism of respiratory failure, paralysis of the intercostal muscles and the diaphragm, occurs in the "spinal type" of the disease, while only the other two mechanisms are results of involvement of the medulla, and therefore can correctly be ascribed to the "bulbar" form. Any of the three mechanisms of respiratory disturbance may occur together.

I. TREATMENT OF PATIENTS WITH PARALYSIS OF THE INTERCOSTAL MUSCLES AND OF THE DIAPHRAGM

Death in the spinal type of poliomyelitis with paralysis of the essential respiratory muscles, that is, the intercostal muscles and the diaphragm, is the simplest to understand and the most distressing to observe. The patient is conscious almost until the last moment and dies of suffocation. Maintenance of artificial respiration for long periods, although an obviously indicated procedure in such a condition, was not practicable before the development of the Drinker-Shaw respirator.

The Drinker respirator is simple in principle and is now well known. It succeeds in accomplishing that which, as a machine, it is supposed to accomplish. Properly adjusted, it will, for indefinitely long periods, ventilate the lungs of a patient, bringing about expansion and contraction of the thoracic cage unless or until the

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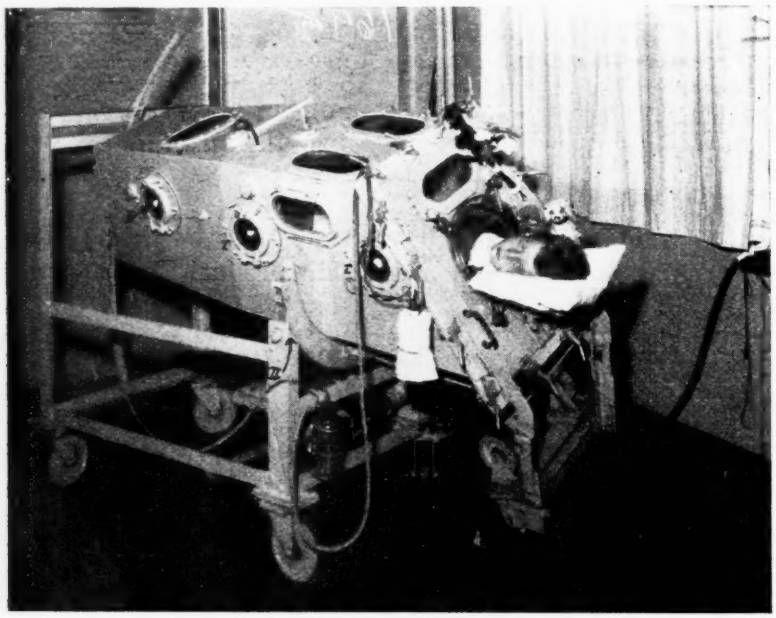
passage of air into the lungs is prevented, either by the patient's own ineffective efforts at respiration, or by the presence of foreign matter in the air passages. Prolonged artificial respiration in an effort to save life in poliomyelitis is, however, sensible only in the hope that much of the paralysis seen in the acute stage of the disease will be temporary, and that with time the patient with paralysis of the essential respiratory muscles will recover sufficiently to breathe adequately by himself. It is evident that in most cases this hope has been justified.

Of these 23 patients, three have died under our care, all of pneumonia. We cannot say that all the others would have died without aid from the respirator. Surely a few of them would have lived. We do believe, however, that many if not most would have died without this aid. Regardless of the ability of the machine to save life, its use has seemed amply justified in the evidence of relief that it gave. Patients with only partial paralysis of the intercostal muscles and diaphragm who did not seem at all near death, who had no cyanosis and made only



I Ports, which when opened allow attendants' arms to be inserted through rubber diaphragms into the machine where various procedures can be carried out at leisure without stopping the action of the respirator.

II Axis on which the body of machine can be tilted so that the head is low (front legs being folded out of way) or rotated from side to side.

Machine made by Warren Collins, Inc.

We have treated 23 children with undoubted poliomyelitis, who had unmistakable paralysis of the intercostal muscles or the diaphragm of an extent sufficient to bring about serious impairment of the respiratory function. Several of these also had paralysis of the pharynx and possible temporary involvement of the respiratory centers. Some of these children suffered primarily from weakness of the diaphragm, bilateral or unilateral. Some evidently had little diaphragmatic weakness but bilateral or unilateral paralysis of the intercostal muscles. The determination of the exact groups of paralyzed muscles and the extent of the paralysis is very important especially from the point of view of prognosis, but is often surprisingly difficult. So far as treatment by means of the respirator is concerned, it is necessary to determine only that there exists a respiratory difficulty which is actually due to weakness of the primary respiratory muscles.

moderate use of the accessory muscles of respiration, would frequently, on being placed in the respirator, drop immediately into such a profound sleep as to simulate coma, a sleep undoubtedly induced by relief from the necessity of constant voluntary attention to respiration. It was an evidence of relief as dramatic as that seen after intubation in children with laryngeal diphtheria.

Mention here may be made of the rates and pressures we have found advisable in using the machine in patients with paralysis of the intercostal muscles or of the diaphragm. In general we tried to use rates between 20 and 30 (our patients were with one exception under 12 years of age). Usually it makes little difference what rate is employed. When, however, there is obstruction to the passage of air for any reason, as in the presence of secretions in the air passages or in cases of pneumonia, the patient cannot accommodate himself readily to

changes in rate. In the case of one child who suffered from pneumonia and intercostal paralysis, rates increasing up to 48 were employed before the patient's respiratory efforts were synchronous with the machine and before he stopped trying to take "extra" inspirations in addition to those initiated by the respirator. It is easily understandable that when any factor prevents deep inspiration a greater respiratory rate is required.

Negative pressures in the respirator, usually between 15 and 20 cm. of water were employed for most of our patients. When pressures greater than 20 cm. were required before the patient stopped using his alae nasi at each inspiration and seemed at rest, it developed that there existed some other factor besides paralysis of the respiratory muscles, such as pneumonia, that was causing dyspnea.

Patients even when extensively paralyzed seemed to have considerable ability to prevent excessive ventilation of their lungs by the machine. The action of the machine evidently is never quantitatively substituted for the patient's own respiratory mechanism. A great deal of information as to the proper control of the action of the respirator was obtained by simple observation of the use or non-use of the alae nasi and by listening with the stethoscope held over the patient's nose or mouth to the quality of the sounds made by the passage of air in and out. Obstruction to the ingress of air by accumulated secretions or by partial closure of the glottis was often detected by this means and the pharynx aspirated or the suction used in the machine reduced until the passage of air seemed free. Extra respiratory efforts spontaneously induced and not synchronous with the rhythm of the machine when detected were sometimes an indication for the use of a more rapid rate of respiration.

In the great majority of cases negative pressures only were necessary for artificial respiration. Passive expiration was usually adequate, even in patients with the most extensive paralysis. Rarely positive pressure may be of value in bringing about a more forceful expiration in patients with paralysis of the abdominal muscles who cannot effectively cough. These children have difficulty in removing secretions from the bronchi or from the throat, especially if they have pharyngeal paralysis. By using positive pressure in a respirator it is possible to teach such a child to cough who cannot do so without this aid. This requires on the part of the patient, however, a deliberate effort, nicely synchronized with the rhythm of the machine and in most children in our experience cannot be accomplished with striking success. A machine running with positive pressure would not aid, of course, in a spontaneously induced reflex cough unless the opening of the glottis happened to coincide with the time of maximum pressure in the respirator.

We believe that we have learned three general principles about the treatment in the respirator of these patients with respiratory paralysis of the spinal type (paralysis of the intercostal muscles and the diaphragm):

1. The machine should be used early, long before the appearance of cyanosis (which is a late sign of anoxemia and in this condition does not precede death by many hours), before there is evidence of marked dyspnea, and at the very first evidence of the existence of any paralysis of the respiratory muscles. There are several reasons for employing the machine before its use becomes essential to maintain life. These are—(a) The possible rapid advance of the disease. Patients who seem quite comfortable in bed, with very little evidence of respiratory difficulty, with perhaps only evidence of paralysis of the shoulder muscles (an almost invariable accompaniment of paralysis of the intercostal muscles), and with only slight evidence of weakness of the respiratory muscles, may within one or two hours advance to a stage where artificial respiration is necessary to maintain life. A situation where a patient may be leisurely moved to a respirator may quickly change to one which necessitates tremendous haste, with speeding ambulances, great confusion, and trauma to the patient. (b) Another reason for early treatment is the possibility of the adverse effect of anoxemia itself upon the course of the disease. It is generally believed that much of the destruction of the nerve cell is due to a local anoxemia produced in the anterior horns, due to edema and lymphocytic infiltration. It seems reasonable that an added generalized anoxemia, produced by inadequate ventilation of the lungs, although too slight to be evidenced by cyanosis, may be a serious additional factor in the destruction of the nervous tissue. Frequently this seems strikingly evident when the condition of a patient in the acute stage of poliomyelitis with pharyngeal paralysis suddenly and permanently becomes worse after an attack of cyanosis produced by choking. (c) The third reason for early treatment is based on orthopedic principles. A slightly paralyzed leg is put at immediate rest long before the paralysis becomes complete; as soon, in fact, as it can be detected at all. It seems reasonable that the same principle should be applied to the intercostal muscles and to the diaphragm and that these respiratory muscles should be given the rest that is made possible by the early use of the respirator, without allowing a child to experience dyspnea. (d) The evidence of relief and comfort as shown by relaxation and sleep mentioned before is alone an indication for the early use of the machine on general medical principles.

2. The patient should be kept in the machine for a long time. The respirator should be looked upon as more than an instrument simply to prevent death from asphyxiation. Many patients after one or two days in the machine may seem to be able to breathe by themselves comfortably in bed. Such patients, evidently much improved from their original condition, may be taken out of the machine and a few hours or even a few days later may be discovered in a serious state of collapse with apparently an increase in the extent of the respiratory paralysis. This phenomenon is occasionally referred to as a secondary advance of the paralysis. It is not necessarily so. It is frequently only the result of cumulative fatigue in a patient who may be able to breathe for himself for a few hours without much evidence of strain but who, after a few hours or days, becomes seriously exhausted. The use of the respirator may well be prolonged for many months as part of the orthopedic treatment of such patients. Treatment of this type has been carried out under the direction of Dr. Legg of the Harvard Infantile Paralysis Commission with what appear to be excellent results.

3. The third principle of treatment has to do with the medical nursing care of the patient apart from the treatment of his respiratory paralysis. The question frequently arises as to what harm the machine can do. Will it produce emphysema? Will it rupture a lung? Will it produce alkalosis and tetany? These possibilities are of minor importance compared with the ill effects which appear from neglect of the nursing care of the patient because of the difficulties brought about by enclosing him in this machine. It is of great importance for the patient's position to be changed frequently. This cannot be emphasized too greatly. The danger of pneumonia is considerable. If a patient cannot swallow, postural drainage becomes necessary. Care of the skin to prevent bed sores is of great importance. Care of the bowels, administration of enemas, administration of parenteral fluids, subcutaneous injection of salt solution, intravenous administration of glucose solution, all frequently need to be carried out without interrupting the action of the respirator. We have been fortunate in having available for most of our patients, during the stage in which they were entirely dependent on artificial respiration, types of machines which can be rotated on the long axis from side to side and also tipped on the transverse axis so that the head is low, and with arrangements so that almost any procedures necessary for the care of a severely ill child can be carried out without stopping the machine. These factors must be considered as being equally as important in the treatment of patients with paralysis of the respiratory muscles as is the maintenance of adequate artificial respiration. Without proper attention to these measures many patients might not survive even though adequate pulmonary ventilation was maintained. This is illustrated by the experience which we have had in two cases. The first was a girl of 7 years who was the first patient ever treated in a respirator. In the early use of the respirator it was impossible to carry out any but the most elementary nursing procedures and these only by stopping the action of the respirator and thus subjecting the patient to great distress. In this case no postural drainage was maintained and the child's position was inadequately changed. This patient died with extensive pneumonia[1]. The second patient was a young man, over six feet tall and very heavy. He was the only patient in the last two years for whom we have been forced to use (during the period in which he was entirely dependent on artificial respiration) a machine that could not be tilted, so that the head was low, or rotated from side to side. He had paralysis of the pharynx as well as intercostal and diaphragmatic paralysis. He became absolutely dependent on the respirator. Although he had pharyngeal paralysis there was no evidence of a disturbance of the respiratory center. There was no loss of consciousness and no irregularity of respiratory efforts. Because of a tracheotomy tube it was impossible to change his position in the machine except to a very small degree. Adequate postural drainage was not maintained. He died, having maintained a continuous fever, after three weeks in the respirator. At autopsy there were discovered infected bed sores, a lung abscess and extensive thrombosis of the pelvic veins. It was believed that the lung abscess was secondary to infected emboli in the pelvic vessels which were themselves secondary to infected bed sores.

The only other patient under our care, since the development of the Drinker respirator, who died suffering from paralysis of the intercostal muscles or of the diaphragm without unquestionable involvement of the respiratory centers, was a child who acquired pneumonia in our ward two months after his attack of poliomyelitis and after sufficient recovery of muscle power had taken place to enable him to breathe alone without any fatigue for eight hours at a time. His death did not seem to be attributable to failure of the respirator.

We believe it worth emphasizing that the use of the respirator in poliomyelitis with respiratory muscle paralysis should be regarded as more than a method to be employed as a last resort to "keep the breath of life" in a patient. Its use should be considered a method of giving needed relief and rest to any patient with weakness of the muscles of respiration. We have seen but one child with paralysis of

the intercostal muscles or the diaphragm (without bulbar involvement) who did not after a short time appreciate and request the use of the machine.

BULBAR FORMS OF POLIOMYELITIS WITH RESPIRATORY DISTURBANCES

The second and third mechanisms as outlined before by which respiratory failure can be brought about in poliomyelitis, occur in the "bulbar" type of the disease. These are (2) interference with respiration due to unswallowed secretions around the glottis in patients with pharyngeal paralysis, and (3) a disturbance of the nerve centers in the medulla controlling respiration.

These two mechanisms are very commonly associated and their differentiation is often difficult.

In the past two years we have treated seventy patients having the "bulbar" form of poliomyelitis; that is, seventy patients with evidence of paralysis of muscles innervated from the medulla or with evidence of involvement of the respiratory centers. Nearly half these seventy patients have experienced serious difficulty with respiration. It has been often difficult, and sometimes impossible, to determine which mechanism was responsible for the respiratory disturbance; whether a true involvement of the "nerve centers" of respiration existed, or whether most of the difficulty was due to local obstruction of the air passages due to pharyngeal paralysis and to fatigue.

II. TREATMENT OF PATIENTS WITH PHARYNGEAL PARALYSIS

The second mechanism bringing about respiratory disturbance occurs in pharyngeal paralysis. The diagnosis of this condition is not difficult. The patient may be heard breathing with an ominous gurgling in the throat. A bold physician may offer a glass of water and if the patient is not aware of his condition he may attempt to swallow, with a consequent severe choking attack, often resulting very seriously. Frequently patients with pharyngeal paralysis, because of the secretions around the glottis which seem to prevent a deep inspiration, breathe in a manner simulating paralysis of the respiratory muscles. A deep inspiration tends to aspirate fluid into the larynx and is frequently interrupted by a forced expiration. Patients cannot or will not take a deep breath on request and often little motion of the intercostal muscles can be detected. Because of the continually interrupted respiratory efforts, due to the pharyngeal secretions, it is often difficult or impossible to determine whether a true involvement of the respiratory centers has occurred. This seems to be even more true after aspiration of foreign material into the bronchi.

There appear to be three dangers from pharnygeal paralysis. First, a choking attack may occur with temporary severe anoxemia resulting in deep cyanosis which, as mentioned before, often seems to have a serious result in itself on the course of the disease. Secondly, the patient may aspirate mucus or vomitus into the bronchial tree and bring about evidence of bronchial obstruction, or even a sudden complete cessation of respiratory effort. Thirdly, the condition may bring about excessive fatigue to a degree that is very serious in itself. This is particularly evident in the type of patient whom we call "nervous". As soon as the child relaxes for a moment's sleep he is immediately awakened by the aspiration of secretions and the subsequent choking and coughing attack.

Therapy in these patients should be directed primarily towards keeping the pharynx free from food, vomitus, and secretions. Although a patient cannot swallow it is easy to feed him by gavage, but these patients have such a tendency to vomit that this method of feeding is dangerous. We believe that food or fluids should not be given to patients with any evidence of pharyngeal paralysis until the temperature is normal and the patient is hungry. Vomiting can best be prevented by keeping the stomach empty. An attack of vomiting is associated with nausea, and nausea brings about greatly increased pharyngeal secretions which in themselves may produce as much disturbance as vomiting itself. Salts, water and carbohydrate in adequate amounts can be administered parenterally and by rectum for long periods. The pharynx should be kept drained so far as possible by postural drainage carried out to an extreme degree. The patient should be tilted to an angle of 30° or 40° and is frequently aided by being kept on his face. In attacks of choking the head may be put even lower. Postural drainage frequently results in a surprising amount of mucus and saliva flowing from the mouth. Aspiration of the secretions from the throat is often of life-saving value. In treating any patient with pharyngeal paralysis, apparatus for aspiration of the throat should be at hand. This procedure, however, should be carried out only as often as is necessary to keep the patient comfortable, as in certain excitable patients it in itself may irritate the pharynx and increase the production of mucus. Often, however, more phlegmatic patients obtain such great relief by aspiration that they request it and sometimes can carry out the procedure themselves.

Adequate administration of fluids by rectum or parenterally is important. Excessive thirst and thick tenacious pharyngeal secretions, difficult to remove, can both often be remedied by a hypodermoclysis of saline solution.

Atropine in our hands in an effort to dry up

secretions has been unsatisfactory. It frequently results in the production of thick, sticky secretions which are very difficult to remove and cause much irritation of the glottis.

In most cases of pharyngeal paralysis we believe that rigid adherence to the details of treatment outlined will prevent serious results from the inability to swallow. During the past year, however, we have encountered several situations where in spite of all care we have felt it necessary to take further steps and have resorted to tracheotomy. Ideally, if a tracheotomy is to be performed, it should be done before aspiration of foreign material has taken place and before choking attacks occur. Actually, however, it seems impossible to determine ahead of time which patients are going to need tracheotomy. We realize that this is a radical procedure, that the majority of patients with pharyngeal paralysis develop no such serious situation, and that unquestionably many patients who have aspirated foreign matter into the bronchial tree, who have been subject to severe choking attacks and have become dangerously fatigued, have survived without any such operation. We have performed tracheotomy in a few cases, however, when the need has already developed, and obtained apparently good results. Tracheotomy enables the patient to be fed with much less fear of choking attacks due to vomiting. It prevents the aspiration of the pharyngeal secretions. It allows the patient to sleep uninterrupted by choking attacks. It is quite easy to keep the trachea itself free from secretions by direct aspiration through the tracheotomy tube. Twice when an emergency tracheotomy has been performed on children who collapsed after choking attack, a large amount of mucus has been removed directly from the trachea with dramatic relief of symptoms. We feel that this procedure offers considerable assistance in a few selected cases.

In so far as these patients have respiratory disturbances due to the presence of unswallowed pharyngeal secretions, the use of a respirator seems for the most part illogical and even contraindicated. We have encountered several situations, however, in which complete failure of respiration has suddenly occurred following a choking attack. In those cases, prompt use of the respirator has proved life-saving.

III. TREATMENT OF PATIENTS WITH INVOLVEMENT OF THE RESPIRATORY "CENTERS"

These patients usually, but not always, have evidence of the involvement of other nerve cells in the medulla; that is, they have paralysis of the pharynx, the soft palate or the muscles of the face. Disturbance of respiration is manifest by irregular respiratory efforts. Respirations are usually jerky, shallow, and sometimes amount to a series of hiccoughs, with evident spasmodic contractions of the diaphragm. Occasionally an extraordinary slow, shallow, and "smoothly" irregular type of respiration, simulating that of tuberculous meningitis, is observed. We have not found satisfactory results in the treatment of "bulbar" poliomyelitis from any of the forms of therapy ordinarily used to reduce edema of the nervous tissue, such as the injection of hypertonic saline solution, glucose or magnesium sulphate, or such measures as repeated lumbar punctures or constant drainage of the spinal canal. For the most part, patients with a "central" disturbance of respiration, unless they also have unquestionable paralysis of the intercostal muscles or of the diaphragm; that is, a respiratory disturbance of the spinal type as well as of the bulbar type, are not helped by the respirator. In many of these cases it is so difficult to determine whether a moderate degree of paralysis of the intercostal muscles and the diaphragm exists that a trial of the machine is quite justified. Usually, however, the patient's own respiratory efforts, obviously ineffective in themselves, prevent the respirator from adequately ventilating the lungs, although occasionally aid from the use of the machine is quite dramatic. We have sometimes found that doses of morphine large enough to depress the respiratory centers have been effective in allowing the machine to act unopposed. Most of these patients, however, die with a rapidly increasing pulse rate and evident cardiac failure in spite of apparently adequate artificial respiration.

RESULTS OF THE USE OF THE RESPIRATOR

We have used the Drinker respirator in the care of twenty cases of the bulbar form of poliomyelitis who have had severe disturbance of respiration and in whom we felt that the respiratory center itself was seriously disturbed, although we cannot be sure that in some the respiratory failure might not have been entirely secondary to pharyngeal paralysis. We have used the machine in the treatment of these patients only as a last resort. A few of these twenty patients may have had some intercostal and diaphragmatic paralysis but most of them had no spinal paralysis so far as could be determined. Of these twenty cases, thirteen died. Of the seven that lived we felt that the use of the respirator was a great if not all-important factor in their survival.

SUMMARY

From experience with ninety patients suffering either from the "bulbar" form of poliomyelitis or from paralysis of the intercostal muscles or the diaphragm we have derived a program for the symptomatic treatment of the various types of respiratory disturbances occurring in this disease. Three possible mechan-

isms were distinguished which brought about respiratory failure. The first, paralysis of the intercostal muscles or of the diaphragm; the second, in patients with pharyngeal paralysis, excessive fatigue caused by continual interference with inspiration by unswallowed material in the pharynx or to actual aspiration of this material; the third, direct involvement of the respiratory "centers".

Twenty-three patients with paralysis of the respiratory muscles were treated in the Drinker respirator. Three died, all of pneumonia. Features believed to be of great importance in the treatment of these patients were (1) early, uninterrupted, and prolonged use of the respirator, to avoid dyspnea or fatigue, especially in the acute stage of the disease; (2) painstaking care of the patients in the respirator in respect to frequent change in position, cleanliness of the skin, care of the bowels, and in patients who had also pharyngeal paralysis, postural drainage and the administration of parenteral fluids.

Forty patients with undoubted pharyngeal paralysis were treated. Therapeutic details of greatest value were (1) avoidance of vomiting by keeping the stomach empty during the febrile period and until hunger returns; (2) postural drainage; (3) aspiration of the throat; (4) adequate administration of parenteral fluids; and (5) in a few selected cases, tracheotomy.

Twenty patients with probable involvement of the respiratory centers or with sudden respiratory failure following an attack of choking were treated in the Drinker respirator. Thirteen of these patients died. It is believed that the respirator was an important factor in the survival of the others.

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USE OF THE RABBIT IN THE ASCHHEIM-ZONDEK TEST FOR PREGNANCY*

BY W. HERBERT GRANT, M.D.,† NATHAN ZIBEL, M.D.,† AND H. E. MACMAHON, M.D.†

IN 1928 Aschheim and Zondek[1] found that the presence of anterior pituitary hormone in the urine of pregnant women injected into immature female mice affected the ovarian reaction of these animals. Since that time much work has been done along these lines both abroad and in this country. Their test consisted in using five immature mice, injecting the urine in divided doses subcutaneously over a period of three days, and then examining the animals at the end of 100 hours. One of the difficulties encountered was that the mice often died because of toxicity of the urine, and the result, therefore, had to depend on the findings of only one or two surviving animals.

Friedman[2], in his work on ovulation in the rabbit, showed that the intravenous injection of 5 c.c. of urine from pregnant women induced ovulation in the same manner as in the mouse, the advantage being that ovulation occurred in twenty-four to thirty-six hours.

Schneider[3], also working with rabbits, reported a series of one hundred cases with very encouraging results. He recorded his tests as early as twenty-four hours, and in some cases of pregnancy he observed the characteristic ovarian changes as early as twelve hours.

The Aschheim-Zondek test, or some modification of it, has become a popular and fairly accurate means of determining the presence or absence of pregnancy in doubtful cases, and has been very helpful in many instances of questionable pathology within the pelvis. Our work was undertaken to test further the practical application of the fact that the pituitary hormone in the urine of pregnant women has a definite effect on the ovaries of suitably chosen rabbits, and to determine the comparative value and limitations of the varied technics already in use.

TECHNIC

After considerable experimentation, using rabbits of different ages, injecting varied quantities of urine, and waiting different periods of time, we chose the method which, in our hands, proved most accurate and most satisfactory. We employed healthy female rabbits aged twelve to fourteen weeks. Such animals weighed from 1300 to 2000 grams. The urine to be injected was collected in a clean bottle in the morning, and if it could not be used immediately was preserved with lysol, using one drop to the ounce. It was tested with litmus paper and if alkaline was acidified with dilute acetic acid. Ten cubic centimeters were filtered through ordinary laboratory filter paper, and injected into the marginal ear vein of a rabbit. Forty-eight hours after the injection laparotomy was performed under ether anesthesia, using such aseptic precautions as sterile gloves, scissors,

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forceps and sutures. The uterus, tubes and ovaries were removed with as little trauma as possible. Lastly, the abdomen was closed and the animals, after recovery, were employed for a variety of experimental purposes. The ovaries were examined carefully at the time of the operation, and our observations were recorded immediately. This is important, because if the organs are allowed to dry, or if they are placed directly into formalin pending a later examination, it becomes more difficult to recognize the early changes. Following this gross examination, the ovaries were placed in ten per cent. formalin for histological study.

In some of our first cases we operated as early as twenty-four and thirty-six hours after the injection, but because of the difficulty at times in recognizing slight but significant changes in the ovaries at the end of these shorter periods, we concluded that they were unsatisfactory.

CLINICAL MATERIAL FOR STUDY

We have used the test in more than one hundred cases. It was necessary to exclude some of them because of insufficient data, and we are reporting here the results in one hundred cases, which have been divided into four groups:

Group I comprised positive controls: patients in whom pregnancy had been previously proven.

Group II comprised negative controls: patients in whom it was definitely known there could be no pregnancy and who showed no pathological lesions within the pelvis.

Group III comprised negative controls: patients in whom it was definitely known there could be no pregnancy but who did show evidence of pathological lesions within the pelvis.

Group IV comprised "unknowns": patients in whom there was a question of pregnancy.

It is unnecessary to mention each of the individual tests and consequently we shall report the results of the different groups and discuss in detail only those cases which are of unusual interest or in which the test was incorrect.

Group I was made up of sixteen positive control cases. The tests were done at different stages of pregnancy, varying from four to nine months (table I). In this group all readings were made at the end of forty-eight hours and all, with one exception, were reported both grossly and microscopically positive. The one error in this group will be discussed in detail below (Case 2).

TABLE I

KNOWN POSITIVE CONTROL CASES SHOWING STAGES OF PREGNANCY AT WHICH TEST WAS PERFORMED

Number of Cases	Period of Gestation	Results Positive	Results Negative
1	4 months	1	—
1	5 months	1	—
4	6 months	4	—
3	7 months	3	—
5	8 months	4	1
2	9 months	2	—
—		—	—
Total 16		15	1

Group II comprised seven negative control cases. Both males and females were included in this group (table II). In this small group of cases all results were negative both grossly and microscopically.

TABLE II

KNOWN NEGATIVE CONTROL CASES INDICATING SOURCE OF URINE IN INDIVIDUAL TESTS

Number of Cases	Source of Urine	Results Positive	Results Negative
1	After panhysterectomy	—	1
2	During menopause	—	2
2	Normal female	—	2
2	Normal male	—	2
—		—	—
Total 7		—	7

Group III was composed of twelve patients, definitely proven to be non-pregnant, who showed at operation or subsequent examination one or more of the following pathological conditions: chronic pelvic inflammation, leiomyomata, cysts of the ovary, or carcinoma of the uterus. The results of the tests in this group of cases were, with one exception, negative. This one case which proved to have been an adenocarcinoma of the uterus, will be discussed more fully below.

We have had no cases of hydatidiform mole, or chorioepithelioma, in our series but positive tests on patients with these growths have been reported by Aschheim[4] and others.

Group IV, comprising the "unknowns," was the most interesting group, and included in all sixty-five patients. Thirty-nine have definitely been proven pregnant and twenty-six non-pregnant. The tests in the positive cases were done at different stages of pregnancy just as was done in the series of positive control cases (table III).

TABLE III

CASES OF PROVEN PREGNANCY SHOWING STAGES OF PREGNANCY AT WHICH TEST WAS PERFORMED

Number of Cases	Period of Gestation	Results Positive	Results Negative
1	1 week	1	—
1	2 weeks	1	—
2	3 weeks	2	—
4	1 month	4	—
13	2 months	12	1
10	3 months	9	1
4	4 months	4	—
2	5 months	2	—
2	6 months	2	—
—		—	—
Total 39		37	2

Of the thirty-nine cases in Group IV which later were proven to be cases of pregnancy the test was reported positive in thirty-seven. The two failures, both cases of miscarriage in the second and third months respectively, will be discussed more fully below. In the remaining twenty-six cases which were later proven to be non-pregnant the test was uniformly negative.

Summarizing the results of the entire series of one hundred cases, it may be seen that the test for pregnancy has permitted an accurate diagnosis in ninety-six per cent. There were four errors. Three of these were in patients definitely proven to be pregnant, whose urine gave a negative test. The remaining case, which gave a positive test, was that of a patient on whom panhysterectomy had been performed one year previously for extensive adenocarcinoma of the uterus.

PATHOLOGICAL REPORT

In making gross and histological examinations of ovaries from lower animals it is very important to know the biological characteristics of the species which one is employing; especially is this true of ovulation, because this occurs at different periods, and under varied circumstances, in different types of animals. The rabbit is an animal in which ovulation, under ordinary circumstances, occurs only after copulation; consequently the ovaries of isolated and immature female rabbits will contain neither corpora lutea nor corpora hemorrhagica. Furthermore, we have an idea of the rapidity with which ovulation occurs in these animals since Asami[5] has demonstrated changes in the follicles as early as eighteen hours after coitus. The progressive changes in the ovary during ovulation have also been studied both grossly and microscopically. Consequently one is now in a position, from either a gross or microscopic examination of the ovaries of normal untreated rabbits, to say whether copulation has occurred, and in recent cases to estimate approximately when this has taken place.

In the last ten years it has been demonstrated that in the hypophysis there is a center for the formation of a hormone that brings sexual glands to maturity and maintains them at this stage. Evans and Long[6], in 1921, observed the effect of feeding the anterior lobe of the hypophysis on the oestrus cycle of the rat. They described gross and microscopic changes in the ovary. This organ increased to twice its size and histologically showed a great increase in lutein tissue.

Zondek and Aschheim[7], in 1927, demonstrated, after extensive experimental studies with mice, that neither the internal secretions nor other tissues, nor non-specific protein, with the one exception of the anterior pituitary, could bring the ovary to maturation. They observed three outstanding changes in the ovary following implantation of the anterior pituitary: first, maturation of the follicles; secondly, hemorrhage into the follicles; and lastly, luteinization of the follicles with the formation of corpora lutea. One year later Zondek[8] isolated from the anterior pituitary a water-soluble substance which was called prolan. When this was injected into female rodents precocious maturation of the ovary occurred, resulting in the formation of mature follicles with precisely the same subsequent changes that occurred following pituitary implantation. The next observation showed that the blood of women during pregnancy contained an abundance of pituitary hormone or prolan, and that this was excreted in demonstrable amounts in the urine. This substance in the urine rises steeply to its maximum after conception and remains at this point until the middle of pregnancy, when it slowly falls.

This physiological observation that the urine of pregnant women contains a substance which produces a response in the ovary of rodents is the basis of the Aschheim-Zondek test for pregnancy.

Siegmund[9], after treating rabbits with prolan, reported the interesting observation that the growth and maturity of the ovary was more intensive the more nearly sexually mature the animals were, and that in very young animals the reaction was practically negligible.

The ovary of a normal young untreated female rabbit is a small, pale grayish white, rather firm, smooth elongated structure, measuring approximately 1 cm. in length and 0.3 cm. in diameter. Several clear areas, less than pinhead in size and visible from the surface, appear on section as minute colorless cysts; these are the developing follicles. If the ovary is placed in formalin and again examined grossly after fixation, the change in color from grayish white to opaque yellowish gray is striking. Histologically one sees rows of developing follicles embedded in an anemic dense connective tissue stroma.

This picture of the ovary of the normal untreated rabbit may be contrasted with the gross and microscopic changes seen in the ovary forty-eight hours after the intravenous injection of urine from a pregnant woman into a suitable rabbit; the ovary becomes larger than normal and is pink, soft, edematous and lobular. The follicles, normally sub-miliary in size, are now distended to form cyst-like spaces, and some containing blood stand out as dark red hemorrhagic blebs. The histological changes may be divided into two groups: first, those affecting the follicle; and secondly, those of the stroma and vessels. Many of the very young follicles are unchanged, but the more mature follicles are extremely dilated. The cells of the stratum

granulosum are stretched, at times desquamated, and mitoses are common. The next change in these cells is one of form and color. They become transformed into lutein cells and then appear swollen and eosinophilic. Minute hemorrhages just external to the granular layer extend in between the cells and into the cyst itself so that the cyst may contain quantities of well-preserved red blood cells. The distended follicles may rupture externally, or even internally, resulting in a hemorrhage extending out into the surrounding stroma.

The first changes to be noted in the vessels and connective tissue of the ovaries are dilatation of the capillaries and edema of the stroma. Vessels that are not perceptible in the normal ovary now stand out engorged with blood. Petechial hemorrhages are visible in the loose tissues and especially in the vascular theca interna. Fibroblasts in this zone of tissue immediately surrounding the distended follicles become stretched and proliferate actively. These cells undergo a process of luteinization quite comparable to that seen in the stratum granulosum. The processes of edema and congestion, of dilatation and of hemorrhages into the follicles, followed by luteinization, constitute the essential changes required for a positive histological diagnosis.

In four cases we observed both grossly and microscopically a response in the ovaries which was of unusual interest in that the reaction was entirely unilateral. One ovary in each case appeared unchanged; the other showed changes quite typical and diagnostic of pregnancy. These non-reacting ovaries, on examination, resembled the ovaries of normal young female rabbits; the follicles were quite immature and showed absolutely no sign of recent stimulation. This observation is important from the standpoint of diagnosis, since it shows that a test is never complete until both ovaries have been thoroughly examined. The cause for this unilateral reaction is not easy to explain. It may be that one ovary was much less mature than the other, which, as Siegmund has pointed out, would be reason enough for lack of ovulation.

REPORT OF THE FOUR CASES IN WHICH THE TEST WAS INCORRECT

The first case belonged to Group III. This group was composed of negative control cases which showed some pathological lesion within the pelvis.

Case 1 (Case 70 of the series).—C. H., a white woman 50 years of age, had undergone panhysterectomy for adenocarcinoma of the fundus of the uterus about one year previous to our test. Since that time she had returned to the clinic on several occasions for deep roentgen-ray therapy of the pelvis. It was at one of these admissions that a specimen of urine was obtained for our test; the case was selected for a negative control. The usual procedure for injecting was carried out and forty-eight hours later the ovaries were examined. One ovary was grossly and microscopically normal; the other was edematous, injected and showed dilated follicles containing blood. Microscopically, the four conditions diagnostic of pregnancy namely, edema and injection, follicular distention, hemorrhage and luteinization, were found.

The second case belonged to Group I, which was composed of the "known" positive control cases.

Case 2 (Case 80 of the series).—R. L., a white woman 38 years of age, was admitted to the clinic April 30, 1931. Her latest menstrual period had been August 30, 1930. Examination showed the vertex of a fetus to be above the brim of the pelvis. The patient was considered to be about seven and one half months pregnant and the case was selected for a positive control. A morning specimen of urine was obtained and injected into a rabbit in the usual manner. After forty-eight hours the rabbit was examined and both ovaries were found to be quite normal. About one month later the patient was delivered.

The third case belonged to Group IV. This group comprised the "unknowns".

Case 3 (Case 100 of the series).—J. M., a white woman 28 years of age, was admitted to the clinic May 8, 1931. Her latest menstrual period was January 21, 1931. The uterus was enlarged to the size of a third month pregnancy, but it showed as well third degree retroversion. A test of a specimen of urine was carried out which, two days later, was reported negative. On May 15, 1931, seven days after the negative test, miscarriage occurred. The fetus was examined and considered to be normal.

The fourth case also belonged to Group IV.

Case 4 (Case 102 of the series).—S. J., a white woman 50 years of age, was admitted to the clinic May 8, 1931. Her latest menstrual period was February 15, 1931. The uterus was the size of a three and a half month pregnancy. The patient was flowing and the condition was considered a threatened miscarriage. A test of the urine was carried out which, forty-eight hours later, was reported negative. On May 12, four days after entrance to the hospital and two days after the test had been reported negative, miscarriage occurred. The fetus was examined and considered to be normal.

REPORT OF SELECTED CASES TO SHOW THE CLINICAL APPLICATION OF THE TEST

Case 5 (Case 11 of the series).—A. B., a white woman 50 years of age, was admitted to the clinic December 21, 1930, complaining of amenorrhea of two months' duration. She had previously been treated in the gynecological clinic for profuse bleeding of several months' duration, which was thought to be caused by leiomyoma of the uterus. Catamenia had begun at the age of 14 and had been regular and of three days' duration. Her latest period was October 22, 1930, when she flowed for only one day. Examination revealed that the abdomen was thick, pendulous, and not tender. A smooth, round mass extended to the level of the umbilicus. The perineum was multiparous. The cervix was soft and rather blue. The clinical diagnosis was leiomyoma of the uterus with a question of pregnancy. A specimen of urine was injected into a rabbit and the test was reported definitely positive. Four months later the uterus was at the costal border; fetal heart

sounds were heard, and parts were distinctly palpable. The final diagnosis was pregnancy with leiomyoma of the uterus.

Case 6 (Case 12 of the series).—L. S., a white woman 30 years of age, was admitted to the clinic January 4, 1931. The chief complaint was amenorrhea of two months' duration. The latest menstrual period was November 3, 1930. On December 3, 1930, the patient noticed slight staining and three days later felt nauseated and vomited. Her periods had begun at the age of 14; they had been regular and of three days' duration. She had been married for five years and had been unable to have children. Early in October, 1930, a lipiodol test had been done, which demonstrated patent tubes, with the right adherent to the posterior surface of the uterus. At the time of her admission on January 4, 1931, the uterus was found to be in good position, and normal in size. The vaults were clear. Because of the history of amenorrhea following the lipiodol test, a specimen of urine was collected for injection into a rabbit; the test was reported positive. The patient was again seen on March 8, 1931, two months after the test had been reported positive, and definite evidence of pregnancy was found.

Case 7 (Case 26 of the series).—R. S., a white woman, 39 years of age, was admitted to the clinic on March 4, 1931, complaining of hot flashes and amenorrhea of three months' duration. Catamenia had begun at the age of 14, and had been regular, occurring about every three weeks and lasting four to five days. In 1925, she had given birth to a stillborn fetus, and in the same year the fallopian tubes had been removed. On examination the uterus was found to be slightly enlarged and in good position. The patient believed she was pregnant. Because of the question of pregnancy or early menopause a specimen of urine was injected into a rabbit. The test was negative. One week following this test a normal menstrual period occurred, which lasted three days.

Case 8 (Case 58 of the series).—L. W., a white woman 45 years of age, was admitted to the clinic March 18, 1931, complaining of amenorrhea of five months' duration and the feeling of fetal movements daily. Her latest period was October 25, 1930. Catamenia began at the age of 14, and occurred regularly, every twenty-eight days. Examination revealed a tumor mass rising to the umbilicus that was soft and symmetrical. There was a question of a fundus beneath this abdominal mass. A roentgen-ray examination failed to reveal a fetus. Urine was injected into a rabbit, and two days later the test was reported positive. On April 13, roentgen-ray examination showed definite fetal parts.

Case 9 (Case 86 of the series).—F. R., a white woman 38 years of age, was admitted to the clinic May 5, 1931, complaining of amenorrhea of three months' duration. Her latest menstrual period was in January, 1931. She thought she was pregnant. She had been delivered six months previously, but the baby was not breast-fed. Catamenia had begun at the age of 15; it was regular, occurred every twenty-eight days, and lasted five days. At examination the uterus was slightly enlarged and in normal position, and the cervix was soft. The diagnosis was subinvolution of the uterus. Our test for pregnancy was performed at the request of the medical service as the patient was losing weight and was constantly worried about her condition. This test was definitely positive. An examination later proved the diagnosis of pregnancy.

DISCUSSION

Incorrect results were obtained in four of the one hundred cases. In such a biological test, there are many possibilities of error; some of these are common to all tests, whereas others are not. Among the former are such unintentional errors as interchanging specimens of urine, using animals that are too young, and using animals of precocious sexual maturity, which have already mated. Furthermore, there is always the chance that the urine may contain too little hormone to provoke a reaction, and in cases in which the test is dependent on a histological examination, the possibility of error is still greater, because of the repeated handling of the specimen in the process of fixation and embedding.

In Case 1, in which an incorrect result was obtained, we were dealing with a patient after complete hysterectomy for adenocarcinoma of the uterus. The possibility of positive tests in patients with tumors of the uterus, ovaries and placenta has been reported, and there is just a chance that this tumor, which had already metastasized, was stimulating the anterior pituitary to the point of hypersecretion. Cases have been reported in which a positive result has been obtained after roentgen-ray therapy.

Case 2 was a "known" positive control. The patient was seven and one half months pregnant. We injected 10 c.c. of a morning specimen of urine into a small, fourteen-week-old female rabbit, weighing 850 grams, and then waited fifty hours before operating. The test was negative. There are two rather individual possibilities of error in this case; on the one hand, the animal was very small and underdeveloped, and, on the other, we were using a specimen of urine from a patient in a relatively late stage of pregnancy, at which time the hormone, as mentioned by Aschheim and Zondek, may be diminishing in the urine.

The remaining two cases which gave incorrect results were cases of pregnancy in the second and third months in which, several days after the test, complete miscarriage occurred. There is the possibility that in both of these cases there was complete separation of the placenta and death of the fetus at the time the test was done, although, as Morse[10] pointed out, it is more common to observe a positive test in cases of incomplete abortion or death of the fetus.

The practical value of the test depends on its reliability during the early stages of pregnancy. On the one hand, it differentiates the cessation of menstruation dependent on gestation and physiological amenorrhea of lactation and early menopause, and, on the other hand, it is extremely helpful in the differential diagnosis of tubal pregnancies and myomas, ovarian cysts, and other types of pelvic pathology.

SUMMARY

A relatively simple hormone test for pregnancy based on the early work of Aschheim and

Zondek is described, and the results of the test in one hundred cases are reported with an accuracy of 96 per cent. The possibilities of error which should be borne in mind in such biological tests are considered. Both the clinical and the pathological aspects of the study are included in the report.

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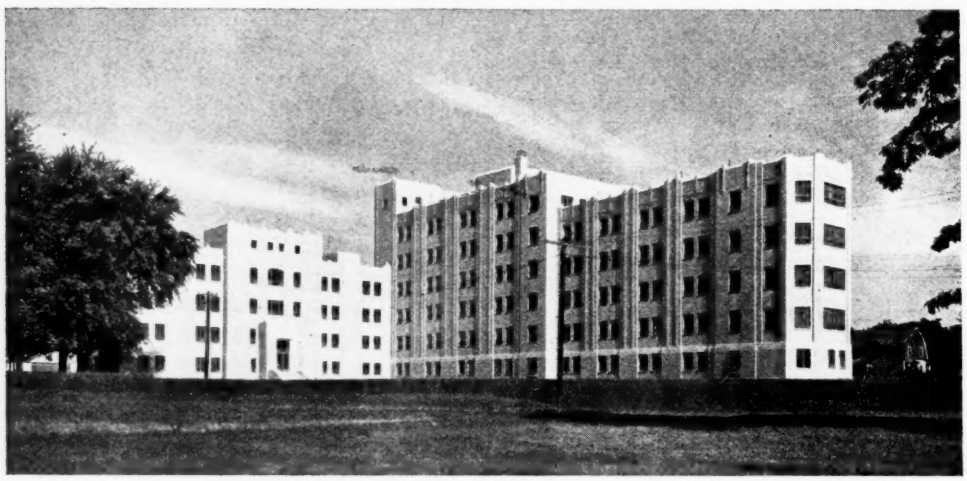
THE SPRINGFIELD ISOLATION HOSPITAL

BY ALLEN G. RICE, M.D.*



SOME three years ago the people of Springfield, convinced that the city lacked the means properly to care for its citizens ill with contagious disease, voted to build a new hospital for such cases. A committee was appointed that had plans drawn and the project well in hand when a political turnover in city government threw it out of office. In spite of the change of horses in mid stream, however, there was no set-back; for a new committee chosen forthwith made no move to undo what had been done, but wisely took up the job where the old committee had left off. From the start both committees, aware that building a hospital was something they knew very little about, sought expert advice and both felt most fortunate to have as consultant, Dr. Edwin H. Place of Boston, whose grasp of the problem and unstinted aid have been invaluable. To his wise counsel, especially his insistence on many details, is due in great measure the fine institution now finished.

The city luckily owned a large plot of land to the east along State Street where stands the City Hospital, the City Home, and a small, out-of-date Isolation Hospital. This broad tract beside a wide thoroughfare with ample trolley service and not too far from the center of population was quite properly chosen as the site for the new hospital. Plans drawn by local architects, Kirkham & Parlett, and approved by Dr. Place were accepted, and ground was broken late in the fall of 1930 by general contractor, E. J. Pinney, Inc. Aided by a mild winter, work went ahead so rapidly that the building was completed, furnished throughout, accepted by the city, and turned over to the Board of Health in just about a year. After a few days given over to formal opening exercises and to public inspection, the new building began to work as a contagious hospital when the first patient was admitted on December 24, 1931.

It is an L shaped building set well back from the street, so placed as to fit into the lay-out of near-by structures and future development, and so oriented as to catch all sunlight possible. Quite modern in its architectural lines, but in no sense peculiar, it is a pleasing, imposing, five-storied building. The short arm of the L houses the administrative and service departments and lodges the nurses and clerks. The long arm is the hospital proper capable of caring for a hundred patients. The construction of the whole building is steel frame encased in concrete. The outside walls are a veneer of grey brick with lime-stone trimmings laid against two thicknesses of ordinary brick and

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a layer of hollow tile on which is spread the inside plaster. All windows are of steel frames, hospital type. The lower and smaller sash is an inverted transom opening in and screened on the outside, sure proof against juvenile disaster; the upper and larger sash is of casement type screened on the inside. All shades are removable and washable. The front door is in the middle of the short arm and opens into a lobby on the administrative floor; the ambulance door is in the rear and opens into the basement of the hospital wing. The floors of reinforced concrete are covered with terrazzo in the lobby, kitchen, service rooms, and bath rooms, with asphalt tiles in the hospital corridors and wards, and with linoleum in the private rooms and in all the rooms and halls throughout the short wing. Ceilings are sound proofed in all the wards and corridors. The two arms of the L are separated by a fire wall through which the only doors are on the first and basement floors, and these can be kept locked at the discretion of the superintendent. There are two push-button silent type elevators, one at each end of the hospital wing. The old isolation hospital has been made over into a laundry; the old power house has been enlarged to take care of the new load.

In the basement of the short wing are the kitchen, food supply store rooms, a cafeteria for nurses, another for the help, and two dining rooms, one for the staff and one for the clerks. Tiled on all sides and electrically equipped throughout, the kitchen is a culinary paradise. A broiler, two ranges each with a two-decked roasting oven, a fry kettle, two soup kettles, several mixers, a potato parer, a meat grinder, griddle plates, an ice cream freezer, many of them automatic, banish much of kitchen drudgery. Most of the cooking apparatus is centrally placed under a large hood from which all odors and fumes are drawn by forced ventilation. Around the sides of the kitchen are sections separated by low partitions, one section devoted to ice cream making, one to baking, another to preparation of meats, and so on. At the farther end of the kitchen are the refrigerators with separate compartments for meats, fish, vegetables, and the like. Each compartment has an outside door as well as an inside, allowing the delivery of supplies from without directly into their respective storage places; all are cooled by a mechanical carbon dioxide system piped from a central plant. Each compartment is divided by a monel metal partition into a large chamber entered from without, and a small one reached from the kitchen. The outside door and the door in the partition are kept locked. The dietitian receives supplies into the outer chamber and each day transfers to the smaller chamber only one day's supply of food, all of which guards against pilfering. At the front of the kitchen is the dietitian's office and beside it a complete small kitchen, also electrically equipped, for special diets. Food leaves the kitchen packed in insulated containers, one for each floor. By dumb waiter each floor receives its quota of containers which are then placed in steam tables in each diet kitchen where individual trays are laid with dishes that never leave the floor. After every meal uneaten food is burned in the incinerator and all dishes are washed and sterilized.

On the first floor the main entrance leads into a spacious lobby set in the middle of a wide corridor. Straight ahead is a comfortable and cheerful waiting room; off the hall way to the left and to the right are the superintendent's office and living quarters, the business office, the record room, the pharmacy, and the other administrative departments. Lodgings for nurses are on the upper floors with a tasteful lounge room, a small kitchen and dining room, and ample bath-room facilities. Above are similar quarters for clerks and maids.

In the hospital wing an asphalt tiled corridor runs the length of each floor, night lighted by fixtures set flush in the side walls close to the floor and so shaded that all rays are thrown downward. There are similar lights in each private room and beside each bed in the cubicles. Each of the four lower floors is divided into seven private rooms; a cubicle ward of sixteen beds; an isolation, sound-proof room; and at the southern end an airy solarium. Each floor is a unit in itself, with a bath room for adults and another for children; a diet kitchen with monel metal fixtures and an electric range, electric refrigerator, and special tube to a central, gas-fired incinerator; a utility room with separate sterilizers for brooms, utensils, and bedpans; an intubation room; and a laboratory.

The ward is divided into sixteen cubicles by glass partitions eight feet high set in metal bases. Each private room has its own lavatory; in the wards one lavatory serves two beds. All beds are of hospital type mounted on large castors. To guard against cross infection all plumbing fixtures, all sterilizers, in fact all apparatus and machinery, are operated by foot pedals or elbow levers; and for the same reason all doors are fitted with hooks instead of knobs. On the fifth floor is a well-appointed operating room with the usual sterilizing outfit, doctors' dressing room with lockers and scrub-up sinks. On this same floor is a Drinker Respirator, a physiotherapy workroom, and an x-ray lay-out. In place of the solarium on all the lower floors there is here an open sundeck to which patients can be brought in beds or in wheelchairs.

In the basement just inside the ambulance door are the admitting room and two examining rooms. Nearby is the sterilizing chamber for patients' clothes which after steaming are hung

in individual bags awaiting the discharge of their owners. Next is a larger sterilizing unit for mattresses. Across the hall are bath rooms for patients about to be discharged. At the southern end of the basement and under the solaria is a class and demonstration room for nurses.

Throughout the whole building are drinking fountains piped from Frigidaire water cooling units. For the main kitchen, all the diet kitchens, all the utility rooms, and all the toilets, there is forced ventilation by motor-driven fans. Doctors are located by numbers flashed on screens placed in each corridor. Patients' call system is likewise one of lights flashed at each head nurse's station. Connected with each intubation room is an electric emergency gong. The cubicle beds are special cribs suitable for children up to ten years of age, and to give the hospital a tasteful variety the beds in each cubicle are of a different color.

The hospital is in charge of the Board of Health and is staffed by a voluntary corps of physicians appointed by the Board. There are at present no internes, but an affiliation with the Springfield Hospital has been made whereby, beginning next July, internes at that institution may have services at the Contagious Hospital. There is no training school for nurses. The nursing is done by graduates hired by the city. The superintendent, likewise superintendent of nurses, is a graduate nurse. The total cost of this special hospital was about $690,000, or in the neighborhood of $6900 per bed, including the fees of the architect and of the consultant.

EXCERPTS FROM HEALTH NEWS PUBLISHED BY THE UNITED STATES PUBLIC HEALTH SERVICE

A report of more than usual interest containing recommendations relating to the public health has recently been forwarded to Congress by Surgeon General H. S. Cumming. In this report it is pointed out that the development and administration of research in public health may be likened to the mining and recovery of a valuable metal. The mining operations, which require scientific knowledge, skill, and patience, and necessitate constant exploration into unfamiliar ground, correspond to the important and necessary research that must be conducted in the public health laboratory, in the field, and in the realm of public health administration. For considerable periods these efforts may seem unprofitable, useless, and quite expensive, just as costly exploration by shafts and drifts, the thinning of a vein and the necessity for handling low-grade ore often make the wisdom of mining operations seem questionable. From time to time, however, public health research results in important discoveries, emphasizing the necessity for constantly searching out and testing new deposits of knowledge that await the patient investigator.

Following the discoveries, a little more than half a century ago, of the bacterial cause of many diseases, additional important scientific discoveries were relatively easy. As exploration progresses, the making of discoveries becomes more difficult; as the field is more thoroughly worked, there follows a period of more routine activity, and the important finds are less frequent; but exploration into what for a time may seem an unpromising field oftentimes yields results that are most useful.

Investigative work into the cause and prevention of disease is not without danger; several workers of the United States Public Health Service have lost their lives in line of duty in connection with studies of various diseases. The Public Health Service has been the pioneer in opening up a number of new fields of scientific inquiry relating to the cause, the mode of spread and the prevention of disease. Scientific studies and laboratory investigations which contain new data or any new facts must be carefully worked over and these new facts must be assembled and interpreted. Scientific discoveries, which, although important and of value, must be put into actual use by public health officers in order that the benefits to be derived from these discoveries may be obtained.

With the progress of public health during the past half century, there has been much improvement in conditions of general environment, such as water supplies, milk, food, housing conditions, and related matters having to do with the environment of the general population. Although there is still need for constant vigilance in these matters, there is not, at the present time, so urgent a need for correction of general environmental conditions. However, with the continued increase of the population in many sections, there are still many important problems relating to sewage disposal and water supplies which must be considered. With the improvement of general environmental conditions, there is need for more emphasis upon the environment of the individual as relates to occupation, personal health, and similar matters. One of the important needs of the present day in public health is the development of facilities for the application of known facts relating to the prevention of disease. This means a strengthening and development of health service as rendered by local, State, and Federal health officials. Important scientific discoveries may be made; but unless such discoveries are applied to the prevention of disease, little benefit results.

MEDICAL PROGRESS

PROGRESS OF GASTROENTEROLOGY IN 1931

BY A. E. AUSTIN, M.D.*

THE usual topics of physiology of digestion, diagnosis and treatment of diseases of the digestive tract have been covered by the literature of 1931 with many new facts discovered.

ESOPHAGUS

Butler[1] reports a case of spasmodic obstruction of the cardia which resisted every effort at dilation from above and he was obliged to open the stomach and dilate from below. No hypertrophy was discovered about the cardia, nor any other reason for this condition of spasm. The forcible dilation to the extent of introducing three fingers was successful and two years later the patient reported himself able to swallow anything in the line of food.

STIMULATION OF GASTRIC JUICE

Schemensky and Geling[2] by means of the use of histamin have been able to divide the so-called achylia gastrica into two groups, a pseudo achylia and a true achylia such as is found invariably in essential anemia. In 111 patients, fractional extraction of gastric contents gave no free hydrochloric acid with either caffein or histamin; these were chiefly pernicious anemias and gastric cancers. Then a group of 55 cases of so-called relative achylias was studied in which while no free hydrochloric acid could be detected in the fasting contents and no acid secretion could be induced by caffein, injections of histamin were able to induce an almost normal secretion of hydrochloric acid.

Their conclusions are that histamin only can separate the true from the pseudo achylias and its use is absolutely necessary in a gastric clinic. Neutral red has also its place as a diagnostic agency as its employment will often enable us to distinguish the cases where the power of secretion is absolutely lost and those where there is some chance of its return. Psychic nervous influences play no part in true achylias; in the pseudo forms, such a causation has not been fully established. Szilárd[3] has experimented with 21 patients to determine whether the use of magnesium causes a diminution in the secretion of hydrochloric acid in the stomach.

Neutral red was injected in quantities of 2 c.c. of a 1% solution on the principle established by Glässner that anything which stimulates the activity of the gastric glands hastens the appearance of the dye in the contents. After a control was established, the same individual received the neutral red and 0.5 gram magnesium peroxide.

In every case, except one of gastric cancer, the use of the magnesium hastened the appearance of the pigment, showing a stimulating effect on the glands, rather than a retarding influence. As this increased activity on the part of the gastric glands is produced by every other alkali, the author questions the advisability of the use of alkalis in pyrosis, and the comfort, sometimes acquired by the patient, in the use of alkalis is not due to the neutralization of the gastric juice but a sedative effect on the mucous membrane of the stomach by the alkali.

Faroy and Deron[4] have found a substitute for histamin in exciting the flow of gastric juice which they consider much superior to the former. This drug is acetylcholine, given intramuscularly in doses of 0.030-0.040 gram. The gastric secretion begins at once and in comparative trials exceeds that produced by histamin.

In cases of hypochlorhydria after 12-15 injections the hydrochloric acid assumes normal quantities. Acetylcholin has also proved of great value in differentiating the relative achylias and the actual (pernicious anemia and gastric cancer) and in the former the secretion continues after the treatment has ceased. A warning is offered by the authors against the use of acetylcholin in old ulcers, in which, with the increase of hydrochloric acid, pain and discomfort may return.

DIAGNOSIS OF GASTRIC DISEASES

Vándorfy, J.[5] has studied 1100 cases of gastroptosis, excluding all those associated with ulcer, cancer, or pyloric stenosis. The number of men was 40.27% of the total, a vastly larger proportion of men than is usually encountered. As causes the author attributes the long narrow chest, i.e., Stiller type, and the rapid loss of flesh, amounting in many cases to 12-24 lbs.

Frequent pregnancies play an important part in women, being found vastly more commonly among women who had borne children. The most common symptom seemed to be pressure over the epigastrium after eating, often amounting to pain. In 46.5% of the cases, however, this pressure bore no relation to the taking of food. Over half of the cases showed a tendency to constipation while nausea and vomiting were found in nearly one-fourth of those examined. While the physical signs of ptosis as shown by the flu-

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oroscope often remained the same, there was an active and a quiescent phase in the subjective symptoms which were quite independent of treatment by diet, medicine, etc.

Haurowitz[6] has sought the products of decomposition of hemoglobin in the gastro-intestinal tract in connection with its significance in the detection of occult blood in the feces. After 4 days of food without blood or chlorophyl, the individual was deprived of 60 c.c. of blood of which 50 c.c. was given him with a little bread. The feces were then examined for several days to determine the character of the blood coloring matter excreted. The results showed that at no time was native hemoglobin or methemoglobin eliminated.

Practically all of the blood coloring matter was excreted as protohemin. However it is possible that bleeding in an achylic stomach or in the upper duodenum may show hemoglobin stripes in the spectroscope as the alkaline trypsin digestion is very slow and this can be used clinically. If confusion exists as to whether the hemoglobin is coming from an achylic stomach or from high up in the colon, its intimate admixture with the feces in the former will designate its source.

Purjesz[7] calls attention to the frequency with which bleeding gastric and duodenal ulcers are accompanied by fever and seeks a cause.

Of the 380 cases, treated in the hospital under his observation, 115 had bleeding. Only those with a temperature of more than 37° Centigrade were regarded as having fever. Of the 115, 84 cases complied with this condition, all having a temperature of more than 37°C. It was noted, of course, that with the hemorrhage, there was a diminution of both erythrocytes and hemoglobin in the blood of the patient and the fever followed this change very closely, i.e., the lower the number of erythrocytes and the amount of hemoglobin, the higher the fever. Experiments on bleeding dogs confirmed this parallel. The conclusion was that probably the loss of fluid caused a change in the normal isotonic character of the blood and thereby produced the fever.

Dienst[8], in order to show the relation and reaction between the acid secreted by the stomach and the mucus, made estimation of both the acid and the nitrogen of the gastric juice. Twelve cases were examined in every one of which high nitrogen content was associated with low values for hydrochloric acid and vice versa.

Average nitrogen content was accompanied by normal values for hydrochloric acid. Hence the author concludes that the mucus which neutralizes the free hydrochloric acid has a powerful influence in controlling the acidity of the gastric juice.

The author is convinced that there can be no other body in pure gastric juice to neutralize the acid except mucus. Furthermore, digestion of the mucus and absorption of the nitrogenous products can play but little part in producing error as the stomach is not an organ of absorption.

Polland and Bloomfield[9] have made a study of 25 cases of gastric anacidity where no digestive disturbances were noted and where there was no possibility of gastric cancer or pernicious anemia, the common causes of this condition. The duodenal tube was used and left *in situ* during the extractions. After all the residual content was removed, each patient received 0.1 mgm. histamin by hypodermic injection per 10 kilo of weight. Aspiration was made every ten minutes but only a few c.c., of mucoid material was obtained, without free hydrochloric acid. The majority of these patients had no subjective digestive symptoms and only two of these showed any abnormal looseness of the bowels.

The authors find that 3-5 per cent of all patients in a clinic show unexplained anacidity and that it occurs in the elderly and those of middle age; hence, by inference, this condition is acquired and is not hereditary. A further study is to be made to determine whether this anacidity is a precursor of gastric cancer.

Hess and Faltitchek[10], attracted by the frequency with which syringomyelia is associated with gastric symptoms, made a study of the gastric secretion in 29 cases of the same and found a gastric achylia in 29% of them, even after the injection of histamin.

In 23 cases of multiple sclerosis, on the contrary, hypersecretion was found to be the rule. A marked difference was also discovered in the emptying time of the stomach; in syringomyelia it was delayed and in sclerosis increased. Hence the authors regard the achylia and the hypotony found in these cases as an outcome of degeneration of the nerves controlling the stomach and not to any inherent atrophy of the peptic glands, muscular atrophy or loss of tone.

TREATMENT OF GASTRODUODENAL ULCERS

Glässner, K.[11] has experimented with injections of neutral, aseptic 1% pepsin solutions in the treatment of gastric and duodenal ulcers with favorable results. The injections in susceptible persons (ca. 10%) produce slight anaphylactic symptoms as do all other protein injections at times. The injections start with 0.2 c.c., given every other day with an increase of 0.1 c.c. each until 0.5 c.c. is given at last; at least 20 injections must be given to assure permanent improvement.

Five hundred patients have been treated in this manner, many of them while still at work. His results are excellent; two-thirds of all cases, treated in this way, have shown both an objective and subjective cure. Recurrences may occur as in all other forms of treatment and

must then be subjected to another course. The earliest effects of the treatment on the patient are disappearance of the pain and tenderness over the site of the ulcer, the night and hunger pains, sense of fullness, heartburn and belching. The diet recommended is soft solids and liquids with 6-7 meals daily.

Lévai[12], basing his treatment of gastroduodenal ulcers upon the remarkable effect of insulin on the healing of superficial wounds, has employed it in 12 cases, one of gastric ulcer and 11 of duodenal ulcers. Two tablets of insulin were dissolved in one-fourth of a glass of water, 2-3 grams of bismuth subcarbonate added, and the whole allowed to stand for several minutes. This is then taken by the patient, fasting, after which he lies down for half an hour. The usual soft solid diet was employed. By means of this treatment, the pain disappeared in all cases within a week; the appetite returned and the patients put on weight. This method can also be employed in ambulant cases but the patient must be seen every 5 days. Fluoroscopic examination before and after treatment extending from 2-6 weeks, showed complete healing of the ulcer.

Cade and Barral[13] have employed insulin in the treatment of gastroduodenal ulcers with very favorable results; the first group of ten patients who received 15 units of insulin daily was relieved of all pain and pyrosis after food in from 3 to 7 days. In six cases insulin alone was not able to relieve the symptoms of ulcer and, half an hour after the injection of insulin, 80 grams of glucose were given in the form of syrup which apparently acted as an adjuvant to the insulin. In one case the insulin was able to relieve the distress where pyloric obstruction was present. In 5 cases no relief of symptoms was obtained by the injections.

Starlinger and Richter[14] have, by careful examinations of the stools for occult blood, attempted to determine the period required for complete healing after a gastrojejunostomy. Every means of avoiding the introduction of foreign blood into the digestive tract was taken. The methods of both Weber and Gregerson were employed for the detection of occult blood in the stool. Thirty patients were investigated on whom a gastrojejunostomy had been done for gastric or duodenal ulcer, producing stenosis.

The cessation of blood in the stool is of the greatest importance in regulating the diet as no solid food should be allowed until the blood has disappeared. In only one of the 30 cases did the presence of blood extend beyond the fourteenth day so that this period may be taken as the extreme limit of the time for complete healing. Some cases were healed, i.e., there was no blood in the stool, on the 8th day and in one patient none even on the sixth day after operation.

PANCREATIC DISEASE

Delhougne[15] has worked out a method for determining the integrity of the pancreas, a weak point in our diagnostic methods. With the duodenal tube, he has found that tyrosin should be present in the fluid removed, if peptones be given by mouth with a normal pancreas. The Mörner test for tyrosin is employed, consisting of cooking a few c.c. of the duodenal contents with a mixture composed of one part of formalin, 45 parts of water and 55 parts of concentrated sulphuric acid: tyrosin gives a pronounced green color which lasts for a long time.

In two cases of acute pancreatitis which were proved by operation, no tyrosin was found in the duodenal contents. In cases of gastric cancer in which the pancreas is not involved though there may be metastases in the liver, the tyrosin was always found present. Hence the absence of tyrosin in the duodenal contents after 30 minutes, always speaks for disease of the pancreas.

Kaczander[16] discusses the great difficulty of diagnosis of disease of the pancreas, with its usual 75% of failures, and urges renewed use of the estimation of diastase in the urine as proposed by Wohlgemuth. Patients to the number of 300, with various abdominal lesions, were tested for the diastase content of the urine and for comparison, many patients with chest and nervous affections were also studied. The urine was always collected when the patient was fasting and, by a modification of the old method, results could be obtained in 18 to 20 minutes.

The normal number of units was taken as 64 and anything over 128 was regarded as abnormal. Among those examined were 4 cases of acute pancreatitis with 1024 units in whom the diagnosis was established by laparotomy with two deaths. There were also 9 instances of chronic pancreatitis with over 64 units in whom convalescence produced a reduction in diastase units to normal. Hence the author urges the continued use of this test in all abdominal disturbances.

DISEASES OF THE LIVER AND BILIARY PASSAGES

Lantodub[17] made careful examination of the gastric contents of those suffering from cholangeitis and cholecystitis, to determine the abnormalities in gastric digestion so commonly complained of by these patients. There were 210 in the group in which the diagnosis was established by operation in 39.9% and by cholecystography in 52.4%. Hypersecretion was found in 21%, normal acidity in 42.9%, subacidity in 22.9% and achylia in 13.2%.

His conclusions are that subacidity and achylia were observed in 36% of the cases of bile duct and gall bladder disease, much less frequently than found by others. Between the duration of the biliary disease and the condi-

tion of the gastric secretion, hypo- or hyperacidity, there seems to be no correlation. This diminished secretion on the part of the stomach is not always dependent on the condition of the biliary passages but may be due to disease itself of the gastro-intestinal tract. Gastric achylia cannot be regarded as a predisposing factor in the production of gall stones as these as well as diseases of the biliary tract occur with hyper and normal secretion.

Pollak[18] has made a further study of galactose as a means of determining the function of the liver. After a determination of the fasting blood sugar, the patient was given some days later, an intravenous injection of 20 c.c. of a 40% solution of galactose and the blood sugar estimated. Normal persons were employed as controls and the results compared.

In the normal cases, the blood sugar reached its highest limit in 15 minutes after the injection amounting to 150 mgms. per 100 c.cm., of blood. In hepatitis, however, there was great delay in reaching its highest level and the blood sugar limit was much lower than in normal individuals, a reduction which was usually proportional to the severity of the hepatic disease. In chronic disease (cirrhosis) also the sugar level was much delayed and low values were found.

Geling[19] refutes the axiom of "a visible gall bladder is a healthy one, an invisible one, pathologic," after cholecystography, by citing many cases in which the failure of the gall bladder to become visible is due to other causes than cholecystitis; for instance, a duodenal ulcer which produces adhesions.

A mucous plug may also prevent the entrance of the bile and the pigment into the gall bladder; the conjoined use of barium and choletest thus demonstrated the outline of the stomach and the duodenum even when the gall bladder is invisible. Even the visibility of the gall bladder is not fully convincing of its normality without a study of its evacuation time with the aid of egg yolk. The explanation that liver disease may cause a non-appearance of the gall bladder has been discredited as in an hour's time, practically none of the dye remains in the blood; it would require a 60% retention to prevent any dye from entering the blood. Sarles and Garcin[20] have compared the results of bile drawn by a duodenal tube and cholecystography in 78 cases of apparent cholecystitis or cholelithiasis; a dose of belladonna was always given one and one half hours before the introduction of the tube to facilitate the passage of the olive through the pylorus. They recommend the use of the liquid tetraiodide orally to the pills which often fail to dissolve and remain in the intestine. In only 4 of the 78 cases was vesicular bile found where cholecystography failed to show a picture of the gall bladder. Their conclusions are that both methods deserve the confidence of clinicians in the study of the permeability of the cystic duct. It is well to begin with cholecystography; if the gall bladder is well defined, tubage is unnecessary but, if the bladder is not shown, a tubage should be done before reaching the decision that the cystic duct is occluded. In no case where the two agreed, did the operation fail to confirm the closure of the cystic duct.

INTESTINAL DISEASES

Oppenheimer[21] declares that there exists a chronic appendicitis which is characterized clinically by hyperacidity, eructations, abdominal distress and distention but without tenderness or temperature. On the radiologic examination depends the accuracy of diagnosis; the normal appendix may fill, but empties rapidly and is only visible during a short period. When, however, the appendix does not fill or remains visible for a long time, it is to be regarded as pathologic. A diagnosis of chronic appendicitis should not be made, however, unless there is distortion of the appendix in the x-ray examination and certain functional disturbances of the stomach or colon.

As for treatment when there is prolonged appendiceal stasis, the organ should be removed, when the stasis is confined to the cecum, it may be well to use atropine, liquid petroleum and a bland diet. At least before a diagnosis of functional gastric neurosis is made, the appendix should be examined by the x-ray.

Crooks[22] describes three cases of ileocecal intussusception at some length and refers to 37 consecutive cases in which he has operated. In 34 of these the ileum had slipped through the ileocecal valve and become strangulated. A common incident in all cases was the enlargement of a Peyer's patch which had produced uncontrollable peristalsis. The portion of the ileum which has slipped through is very liable to be gangrenous but can usually be resected without disturbing the colon.

Reschke[23] reports the results in the treatment of 50 cases of postoperative ileus, either directly after operation or after long periods; of these two with recent obstruction and two with old ones died. In 37 instances it was only necessary to free the adhesions causing the obstruction. In 19 patients the obstruction was found in the upper intestine, several times high in the jejunum. The author gives warning that any crampy, abdominal pains in an individual who has had a laparotomy, no matter how long before, should always arouse suspicion of adhesions and obstruction. There should be no hesitation in reopening the abdomen when there is retention of gas and feces, distention of the abdomen, or vomiting, as later symptoms.

Mayer-List[24] reports 5 cases of severe secondary anemia, one approaching a pernicious form,

in which the only causative factor found was megalocolon as demonstrated by radiology. The author believes that a toxin is evolved by the colon stasis which damages the liver and secondarily produces marked destruction of the blood. His advice is that, in all forms of severe anemia, an examination of the colon by the x-ray should be made.

Schilling[25] reports the case of a soldier who for 13 years had harbored amebae in his intestine, acquired in Africa. Long periods passed without an outbreak and during these intervals he was regarded as a malingerer because no amebae could be found in the stool. Finally, 13 years after the orginal infection, by means of rectal injections, mucus was found which contained numerous entamebae histolyticae. As an original infection in Berlin has practically never been discovered, the disease must date back to his original infection, 13 years before. Schelling warns against denying a war origin of disease to former soldiers, even if long periods have intervened since the war.

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OCCUPATIONAL FATALITY RATE AMONG POLICYHOLDERS IN THE INDUSTRIAL DEPARTMENT OF THE METROPOLITAN LIFE INSURANCE COMPANY

Greatly reduced industrial activity throughout the whole of 1931 resulted in the lowest death rate from accidental injuries arising out of or in the course of employment ever recorded for adult white male policyholders insured in the Industrial Department of the Metropolitan Life Insurance Company. The facts for a twenty-year period, for which such records are available, show this clearly.

Occupational fatalities during 1931 occurred at the rate of 27.3 deaths per 100,000 adult white male policyholders; a decline of 12 per cent from the rate of 31.0 per 100,000 for 1930. Each of the principal means of accidental injury showed a marked decline, as compared with 1930, with the exception of occupational automobile accidents, for which the rate increased 21 per cent. The rate in 1931 for all occupational fatalities was .2 deaths per 100,000 lower than that in 1915, and two deaths per 100,000 lower than in 1921, the years with the next lowest rates. These years, like 1931, were characterized by low business activity and widespread unemployment. In general, the insurance analysis shows that the curve for the occupational fatalities follows the curve of business conditions. The low rates for the years cited are in striking contrast to the high rates for 1913, 45.7 per 100,000; 1918, 40.9; and for 1923, 40.1 per 100,000. The high rate in 1913 exceeded the low rate in 1931 by 67 per cent.—*Statistical Bulletin, Metropolitan Life Insurance Co.*

MOTHER'S DAY, 1932

Mother's Day, to be celebrated this year on Sunday, May 8, will be devoted not only to filial attentions through letters, visits, candy, and flowers, but also to an intensive nation-wide campaign to reduce the excessively high death rate of mothers in childbirth. Authorities maintain that of the 16,000 mothers who die annually from this cause, 10,000 might be saved through adequate maternity care. The Maternity Center Association, with its headquarters at 1 East 57th Street, New York City, reports that plans for the campaign are taking concrete form among women's clubs, church and civic organizations, health departments, medical societies, and nursing groups. It is reported that in a similar campaign last year as many men as women became interested, and this year special efforts will be made to awaken prospective fathers to the fact that to have a well baby and a healthy mother, more is required than simply to "let nature take its course". The Maternity Center Association states that it will be glad to help local organizations everywhere to improve community conditions by supplying, free of charge, material for speeches, programs for clubs and church services, and other campaign aids. — *Children's Bureau, Washington, D. C.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
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CASE 18171

DYSPNEA AND DROPSY IN A COLORED MAN OF TWENTY-EIGHT

MEDICAL DEPARTMENT

A colored American lawyer twenty-eight years old entered the hospital complaining of dyspnea, orthopnea, edema, ascites and exhaustion.

At three years he had pneumonia. Following this he developed as a weak child. His physician advised against the ordinary routine of life. The child was taught at home. From the ages of twelve to sixteen he gradually gained strength. In high school he entered into all the usual activities, was a leader in his class work and captain of the hockey team. He played some football and baseball. At sixteen he entered college, where he studied hard. He was told by the college physician that he should not go into athletics or lead a strenuous life. While in college he developed a chronic cough. Chest x-rays showed evidence of some disease. He was advised to go to southern France. At the end of his sophomore year he entered a French university. He did not however take care of himself, but led a full life, with little limitation of activity. His cough improved somewhat. He became ill however, and was in a hospital for two weeks with grippe complicated by pain in the chest, palpitation, dyspnea and orthopnea. His parents received a cable that he probably would not live. He recovered however and returned to the United States in improved general condition. During the next three years he studied law, graduating with honors. He stubbornly disregarded all medical instructions and attempted to show his physicians that he could live a life of unrestricted activity. He went to night club parties and dances almost every night. He had only one short illness during the three years. When he began to practice law he worked hard over his cases, lost much sleep and lived an irregular life at high tension. He developed shortness of breath, swelling of the ankles, weakness and nervousness. He was studied for three weeks in a hospital, but left against advice. The summer before admission to the Massachusetts General Hospital he disregarded all advice and lived as he pleased. In August he noticed persistent edema of the ankles and swelling of the abdomen. In November he collapsed from weakness and exhaustion and for the next three months was confined to a nursing home. He had frequent vomiting. At times he had extreme difficulty in getting his breath so that he had to sit up. He used three or four pillows. At times he could not sleep at all. Nevertheless he carried on a certain amount of his law work in bed. In January he took an automobile drive and was up on several occasions. During the two weeks before admission there had been gradual increase in his ascites and edema. In March, ten days before admission, he became very irritable and was worried over some of his law cases. Realizing his serious condition, he consented for the first time to go to a hospital. His weight had increased during the illness.

His father had had a subarachnoid hemorrhage, but was now leading a strenuous legal life at the age of seventy-three. The patient had had no serious illnesses and had been well except for the symptoms recorded. He did not use alcohol in excess.

Clinical examination showed a dyspneic, malnourished, jaundiced man sitting up in bed coughing frequently. The skin showed slight cyanosis. There were a few cervical glands. The heart was greatly enlarged. The left border of dullness was 15 centimeters to the left of midsternum, 6 centimeters outside the midclavicular line. The right border was 5 centimeters to the right. The supracardiac dullness was 6 centimeters. There was slight pulsation of the neck veins. There was a very coarse systolic murmur in the aortic area transmitted down to the apex, where there were diastolic and systolic murmurs. At the base there was a questionable early diastolic and a thrill. There was pulsus trigeminus. The systolic blood pressure was 100. The diastolic was not made out. There were râles at both bases and an area of bronchial breathing below the left scapula. The liver was greatly enlarged but not pulsating. There was marked ascites. There was slight tenderness in the epigastrium and over the liver. There was edema of the scrotum and penis and marked pitting edema of the legs. The fingers were clubbed. The pupils and reflexes were normal.

The urine was normal in amount and specific gravity. There was a trace of albumin. Acetone was present. The sediment showed 3 to 5 white cells per field and was loaded with hyalin and granular casts. Blood examination showed 12,000 white cells, 71 per cent polynuclears, hemoglobin 80 per cent, reds 5,300,000, with slight achromia. The smear was otherwise normal. A Hinton test was negative. The non-protein nitrogen was 61 milligrams, the icteric index 15. A van den Bergh test showed 3.28 milligrams, direct reaction.

The temperature was 99° to 103.2°, the pulse 75 to 130. The respirations were 17 to 27.

The patient was very weak during his two days in the hospital, with beginning Cheyne-Stokes respiration. During the second twenty-four hours his edema increased markedly. On the second morning his temperature went up to 103°. After vomiting he very suddenly died.

Clinical Discussion

BY RICHARD C. CABOT, M.D., AND MAURICE FREMONT-SMITH, M.D.

NOTES ON THE HISTORY

Dr. Cabot: Without knowing anything more about the case than is given in the first sentence, I think the chances are at least nine out of ten that he died of heart disease. The other possibilities are of course kidney disease and obstructive disease of the chest, but just on the doctrine of chances he probably died of heart disease. He was twenty-eight, therefore he probably did not die of the hypertensive type; he probably died of the rheumatic type.

The college physician told him not to go into athletics or lead a strenuous life, so presumably some heart trouble was found at that time. College physicians used to be much less competent in this matter than they are now. I know a great many men who were kept out of athletics by a heart murmur when the heart was perfectly sound. Today when a man is kept out of athletics he usually does not deserve to be in it.

The fact that he was advised to go to southern France means presumably that they thought he had tuberculosis. A "process" for which a young man in college was advised to go to southern France might mean that. It might have been bronchiectasis of course.

We very seldom get orthopnea from tuberculosis except in the last stages. It is not probable therefore that he was suffering from tuberculosis only if he had orthopnea at that time.

Of course it is perfectly possible that he had tuberculous pneumothorax there, which would give him orthopnea and from which he might perfectly well recover.

Notice that the first time he had swelling of the ankles was after he began to practice law.

The case is not nearly so clear cut as I thought it would be from the first symptoms. He had had no rheumatism at all, so far as our knowledge goes. He was very young for any other type of heart trouble. He had had signs and symptoms that apparently led his physician to think he had tuberculosis of the lungs. The persistent vomiting which he had at one time makes us wonder whether there might be renal trouble. So certainly the kidney as well as the lungs and the heart must be in our minds as we read the physical examination.

NOTES ON THE PHYSICAL EXAMINATION

The supracardiac dullness was not so much as one would expect.

We are not told whether the thrill was systolic or diastolic. My impression is that it was systolic, because so very few diastolic thrills are ever felt at all at the base. We often feel systolic thrills at the base and diastolic at the apex. We almost never feel a diastolic thrill at the base. So my guess is that that was a systolic thrill.

"The diastolic pressure was not made out," and therefore presumably was very low. Therefore presumably there was some aortic disease, as the murmurs make us suspect.

The apices of the lungs were apparently clear. Nothing is said about any trouble at the top, where one would expect trouble if he had had tuberculosis. We have only these râles at the bases, and those would naturally come from his heart trouble.

His kidneys can concentrate urine, so that we can exclude hyposthenuria. On the whole I cannot say that I see any evidence of nephritis from that urine. There may be other evidence to point to the kidney.

The non-protein nitrogen of 60 milligrams is rather high, but I think that with a bad heart it might perfectly well be there.

The icteric index is not particularly high, though it is abnormal.

The chart shows that most of the time the temperature was on the hundred line, shooting higher at the end.

DIFFERENTIAL DIAGNOSIS

We come back at the end to just what we started from. I think he died from rheumatic heart trouble. We do not on the whole find any evidence to incriminate the lungs. Why he was sent to southern France I do not know. There is no evidence that he was sent there for his lungs. There is no x-ray. We have not the clinical record at that time. He did not have sputa apparently. Maybe they knew he had heart trouble when they sent him to southern France.

Dr. Tracy B. Mallory: He did have persistent purulent sputum over a period of years. That did not appear in our clinical record, but I know it is true.

Dr. Cabot: Chronic purulent sputum in a person able to get about means tuberculosis or bronchiectasis. If the apices are anything like clear it is more likely to mean bronchiectasis.

Dr. Maurice Fremont-Smith: There was a patch of bronchial breathing at the angle of the left scapula. Do you think that is a large heart pressing back there?

Dr. Cabot: It is hard to say anything about that. It might have been an infarct; it might have been fluid. I suppose it might have had something to do with the heart.

DR. FREMONT-SMITH: In children it is possible for large hearts without effusion to give dullness and increase of expiration at the angle of the scapula.

DR. CABOT: I have no doubt you are right. I feel that there is no evidence of pneumonia here. It was not until the very end that the temperature shot up. The blood was not like that of pneumonia. I should suppose the bronchial breathing was in some way related to the heart trouble and some feature of passive congestion. With the little evidence in the lungs it is quite possible that I may turn out to be wrong, but from the facts given us I should say we cannot be clear about lung trouble of any sort; both tuberculosis and bronchiectasis are conceivable but improbable.

I should say the same about the kidneys. The kidneys may have shown chronic glomerular nephritis. Because of his age that is the most probable type, if he had any nephritis. Probably there is nothing but passive congestion.

The heart of course is the thing which interests us. As he is twenty-eight and as there seem to be lesions at the aortic as well as at the mitral valve, rheumatism seems much the most probable underlying cause. The heart was very much enlarged apparently. That would fit with its having two valves involved rather than one. The low diastolic blood pressure, the diastolic murmur and the systolic in the aortic area with apparently a thrill at the base make us feel that he probably had aortic stenosis and regurgitation and mitral stenosis and regurgitation both of rheumatic origin.

When we see as much as that in a person who has presumably had it as long as he has had it, other possibilities ought to be mentioned. There is a possibility of trouble in the tricuspid. That may be present without our being able to point to any definite signs of it. There is a possibility of adherent pericardium, too.

I do not see that we have any evidence of anything more than passive congestion elsewhere in the body. The urine examination was imperfect. There was only one examination. There is only one record of a blood nitrogen. On the evidence before us I do not think we can say more than renal passive congestion. The liver is presumably congested. The jaundice we ought to say something about. He had an icteric index of 15. How did the sclerae look when you saw him, Dr. Mallory? Was jaundice noted at the autopsy?

DR. MALLORY: I think not.

DR. CABOT: So he could not have been much jaundiced. We could look at that as a matter of his negroid sclerae, which are naturally yellow. We need not take that seriously. There is no record of bile in the urine.

DR. MAURICE FREMONT-SMITH: Might he not have had jaundice from chronic passive congestion?

DR. CABOT: We see so many extreme cases of chronic passive congestion lasting for months without jaundice that it seems that we must have some other factor to add to the chronic passive congestion to account for jaundice.

A STUDENT: How about the clubbed fingers?

DR. CABOT: All I can say about that is that a certain percentage of cases of chronic heart trouble or of chronic lung trouble of any type have clubbed fingers. That percentage is larger in people who acquire their disease in youth, though we see the sign in people who acquired disease later. Why some of these people have clubbed fingers and others do not I have no idea. I do not think it has been explained. We are apt to find clubbed fingers in cases of congenital heart disease, but that does not seem likely here.

DR. MALLORY: The question of congenital heart disease was very seriously raised at the other hospital he entered; the patient's relatives stated that the medical chief of staff there made that diagnosis.

DR. CABOT: There is no question but that clubbing of the fingers is commoner in congenital heart disease than in other types, but I have seen it in ordinary mitral stenosis. As long as this question has been raised I ought to spend a little more time on committing myself on the matter of congenital heart disease. He was able to do very hard athletic work, which very few patients with congenital heart disease can do. No cyanosis was noted at birth. His murmurs were not of the type that we get ordinarily with congenital heart disease. Most cases of congenital heart disease have systolic murmurs; only a few have diastolic murmurs. On the other hand the thrill which he had is very common in congenital heart disease, and we have no rheumatic history. That has to be faced. Of course that does not in any way rule out rheumatic heart disease. In a good many cases the pathologist is able to agree with us that it is rheumatic heart disease, although there had never been any history of rheumatism. On the whole I would rather say rheumatic heart disease than congenital, though I recognize the possibility of the latter. Obviously the heart ought to be very big, I suppose both sides of the heart, not merely one.

DR. FREMONT-SMITH: If a congenital heart fails to the extent his did in France, isn't it less likely to recover as his did?

DR. CABOT: I cannot answer that. Most of these patients do not grow up. The few such lesions I have seen in adults were borne perfectly well, that is, most of them were defects of a kind which the patient bears for years and then dies of some other disease. So I cannot say what happens in the failure of compensation in congenital heart disease.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Rheumatic heart disease with congestive failure.
Mitral stenosis and regurgitation.
Aortic stenosis and regurgitation.

DR. RICHARD C. CABOT'S DIAGNOSES

Rheumatic heart disease, probably aortic and mitral stenosis and regurgitation, possibly tricuspid stenosis, possibly adherent pericardium.
Probably bronchiectasis.
Chronic passive congestion of all the organs.

ANATOMIC DIAGNOSES

1. *Primary diseases.*

Aortic stenosis.
Possibly very slight non-deforming endocarditis of the mitral and tricuspid valves.
Hypertrophy and dilatation of the heart.

2. *Secondary or terminal lesions.*

Bronchiectasis of the lower lobe of the left lung.
Passive congestion of the liver.

PATHOLOGIC DISCUSSION

DR. MALLORY: I should like to emphasize one point in regard to cardiac failure in certain of the commoner types of congenital heart disease such as interventricular septum defects or patent ductus arteriosus, which permit of an exchange between the major and minor arterial circuits. Ordinarily the pressure is higher in the major circuit, so that any flow of blood that occurs will be from the left to the right side of the heart or from the aorta to the pulmonary artery, so that there will be no cyanosis unless the defect is a huge one. When these cases fail it is usually the left ventricle which falters and the right side temporarily predominates. A paroxysm of cyanosis results from the shunting of venous blood into the left ventricle. I have seen two or three such cases as that. Such a mechanism would not hold for pulmonary stenosis; but those cases are probably always cyanosed from birth.

The heart in this case was a very large one, weighing 500 grams, with marked hypertrophy and dilatation of all the chambers. The aortic valve showed an extreme degree of stenosis. There was marked calcification of all the cusps; in fact it was typical of the kind of stenosis we ordinarily see only in people of fifty or older. In addition to the long-standing chronic stenosis there was a fresh acute endocarditis on the aortic valve. There was no very definite lesion on any of the other valves. The mitral and tricuspid valves showed very slight and questionable thickening of the margins. There was no significant degree of involvement of either. I do not believe there was any real mitral stenosis or regurgitation, although a relative stenosis is a possibility. The left ventricle was greatly dilated, and the mitral valve measured 9.5 centimeters. That might be considered relative stenosis in proportion to the size of the ventricle. Such relative stenosis is sometimes given as the explanation of the peculiar murmurs that we get in the mitral area in cases of aortic disease.

The lungs showed very definite bronchiectasis in the left lower lobe, so I think it is possible that those signs in the left base were significant. It was a very long-standing process. I think in all probability it went back to childhood, although it perhaps may have dated only to the attack of influenza in France. We can be sure it went at least as far back as that. It may also well have been the chief factor in the clubbing of the fingers.

It was rather interesting that we should have this extreme aortic stenosis with practically an absence of any mitral lesion in a young person. It is the type of thing ordinarily seen only in quite elderly people. Perhaps it is of some significance in that connection that he did not have a definite rheumatic history, because we really do not know with any certainty what the etiology of the senile type of aortic stenosis is. It is comparatively rare to get a good rheumatic history in those cases. Here we have the same type of heart disease in a young man, and again we have no rheumatic history.

DR. CABOT: Was there nothing in the muscle that would back up any idea of rheumatism?

DR. MALLORY: I can find no evidence of it.

DR. FREMONT-SMITH: Is arteriosclerosis considered the etiology of aortic stenosis when it occurs in adults?

DR. MALLORY: The point is widely debated. Recently the trend of opinion is against it. I think it is the result of an infectious type of endocarditis, and that it is possible that it may rest upon some other type of infection than recognized rheumatic endocarditis, but I have no proof of it.

DR. FREMONT-SMITH: What did the liver show?

DR. MALLORY: An extreme degree of passive congestion, one of the most marked degrees I have ever seen.

DR. GEORGE W. HOLMES: Was there any evidence of arteriosclerosis in the other parts?

DR. MALLORY: No.

DR. HOLMES: Do these cases ordinarily show arteriosclerosis?

DR. MALLORY: The elderly group of calcified aortic stenosis usually does, and for that reason the lesion has often been classified as arteriosclerotic.

CASE 18172

WEAKNESS AND SWELLING OF THE LEGS

Medical Department

PRESENTATION OF CASE

Dr. Alfred O. Ludwig*: A fifty-four year old white married native housewife came in November 14 complaining of weakness.

Five months before entry she began to have "weak spells". One month after the onset she became so weak that she had to sit down even after doing simple tasks about the house. Two and a half months before entry her doctor found that she had anemia and gave her iron, arsenic and strychnine. He noted that she had a sore spot on the left thigh. This gradually extended and the thigh became swollen and black and blue. She was in bed four weeks with a diagnosis of phlebitis. Two weeks before entry the other thigh began to swell up and became sore and discolored. She had had varicosities in this region before. She vomited brownish flaky material, later bright red blood. Since then she had had considerable gas and distress after eating.

The family history showed that one sister had died of pulmonary tuberculosis. The patient had had one stillbirth.

She had had malaria in her twenties. Twenty-five years before entry she had suspension of the uterus and appendectomy. Five years before entry she had a cervical repair and questionable hysterectomy. She had had decreased hearing in the right ear for several years. Ten years before entry she had had bronchitis for several weeks. During the year before entry she had lost 20 pounds.

Physical examination showed a very obese middle aged woman, weighing 200 pounds. The skin and mucous membranes were definitely pale. The pupils were slightly irregular. All the upper teeth had been removed. The heart action was rapid, the rhythm of a tic-tac character. The blood pressure was 110/60. The abdomen was normal except for extreme obesity. The right leg was swollen, with thick brawny edema over the posterior and internal aspect of the upper calf. In this region there was extreme tenderness on palpation. There was pitting edema of the legs and ankles below this area. There were a few ecchymoses. There were also a few dilated venules on both legs. The fundi were normal.

Laboratory examination showed the hemoglobin 52 per cent, Sahli, the red cell count 3,910,000, the white cell count 12,000. The smear was normal except for polynuclear leukocytosis, 86 per cent polynuclears. There was marked achromia and moderate variation in the size and shape of the red cells. One guaiac test on a stool was moderately positive. It was questioned whether that was due to the iron which she had been receiving.

At that time we thought that possibly she had phlebitis and secondary anemia and probably some gastric lesion as to the nature of which we were not certain, either ulcer or carcinoma.

She ran a constantly septic temperature, swinging between 100° and 103° during the entire course in the hospital. We were never able to do a gastrointestinal series on her. The urine was consistently negative. The white cell count gradually increased from 12,000 at entry to 29,000 on the day of death. The hemoglobin remained at 50 to 55 per cent. The red cell count was 3,910,000 to 3,400,000. After the one positive guaiac on the first stool there were five subsequent negative ones at various times, then two positive ones at the end. We did two guaiac tests on the vomitus. Both were positive. One specimen of vomitus to be examined showed no free acid and 55 units of combined acid.

Six days after she entered the hospital she complained of pain on breathing, cough and compression under the heart. Although there was no bloody sputum and no rub to be heard we felt that she probably had a small infarct there. Two weeks after she came in she developed dullness, diminished breath sounds and moist râles at the right base. We felt there was probably a small bronchopneumonic process. She continued to have a good deal of pain in attacks in the left anterior chest with very few signs, typically few râles. After she had been here about a month she began to have diminished breath sounds, dullness and râles in the left chest in the back, possibly bronchopneumonia. X-ray showed collapse and bronchopneumonia there.

She became increasingly dyspneic when in the hospital and the dullness increased at the right base. At one time we thought she might have a small amount of fluid. X-ray did not bear that out. She showed rather more signs of collapse. She was put in a cardiac bed about the fifteenth of December and developed very marked edema. We had her in a semi-sitting posture. We thought she might have some cardiac failure because of the very high pulse rate, the pitting edema and the râles at the bases. Digitalis however did very little good. Six days before she died we noticed slight jaundice of both the sclerae and the skin. A liver function dye test showed 55 per cent retention. The icteric index was 20, the van den Bergh 3.75. The jaundice rapidly increased. Four days later the icteric index had risen to 35 and the van den Bergh to 7.5. There was a liver function still of 55 per cent retention. Four days before she died we felt her liver three

*Senior interne on the East Medical service.

fingerbreadths below the costal margin and felt it to be nodular. On the day of death both legs and the lower abdominal wall were found to be very grossly edematous. She died on the twenty-ninth of December.

Dr. Aubrey O. Hampton: This first chest film was taken December 7. I think one could assume the patient was obese from looking at the film. The diaphragm is unusually high. We demonstrated linear dullness above the right diaphragm and some dullness in the cardiophrenic angle. I think that film was taken to demonstrate the respiratory motion of the diaphragm. It demonstrates motion, but I do not know how much the diaphragm moved. We see these lines very often in atelectasis. We also see a line in the right side due to thickened pleura. We see that in the region of the interlobar septum and the upper lobe. The films are not good enough in quality for us to tell much about the finer detail in the lungs.

This film was taken fifteen days later. Again we tried to demonstrate the excursion of the diaphragm and failed. The right lung is duller than it was. She has one of those lines on the left side now. I think we generally interpret that as indicating that most of the changes are due to pressure atelectasis. It would be impossible to discover a lung lesion within a collapsed area.

Clinical Discussion

Dr. Chester M. Jones: Could that linear band be a small infarct?

Dr. Hampton: Yes.

Dr. Jones: She had fluid there at one time. I thought someone said something about an infarct.

Dr. Hampton: We do not usually suppose such shadows are old infarcts because of the shape. Infarcts are more likely to be triangular and mottled.

Dr. Leland S. McKittrick: I think my note at the time, three days before death, covers the case probably better than anything I can say now. I wrote, "I take the large firm irregular mass in the epigastrium and left upper quadrant to be the left lobe of the liver with enlargement due to malignant disease. From her story the most probable primary source would seem to be the stomach. To explain the high edema (excluding cardiorenal disease) one should assume a process involving the inferior vena cava, probably a phlebitis, possibly from a malignant thrombus. While carcinoma of the liver may give a high temperature I am inclined to feel that some of this patient's fever is due to the phlebitis. I suggest only symptomatic treatment."

Clinical Diagnoses (From Hospital Record)

Carcinoma of the stomach with metastasis to the liver.
Phlebitis.
Bronchopneumonia.
Hepatitis.

Anatomic Diagnoses

Adenocarcinoma of the stomach with metastases to the regional lymph nodes, the bronchial nodes and the liver, and with extension to the pancreas.
Jaundice.
Thrombosis of the vena cava and iliac veins.
Localized acute pancreatitis.
Pulmonary emboli.
Infarcts of the lungs.
Complete atelectasis of the lower lobe of the right lung.
Tracheitis and bronchitis.
Slight bronchopneumonia.
Uterine polyp.
Choledocholithiasis (cystic duct).
Cholesterosis.

Pathologic Discussion

Dr. Tracy B. Mallory: At autopsy we found exactly what Dr. McKittrick predicted. There was cancer of the stomach, fairly large, beginning 5 centimeters above the pylorus, running up the lesser curvature and posterior wall and showing a crater.

There were extremely extensive metastases to the liver, which was enlarged to 5000 grams. It was grossly nodular.

There was massive thrombosis of both iliac veins and the vena cava running up to the point of passage through the diaphragm. The occlusion was not absolutely complete, and just at the level of the renal veins it became distinctly less complete than it was below that point, so that there was a small channel through which the returning blood from the renal veins could pass upward. That is in contrast to a case of Dr. Barney's we presented last autumn with ascending thrombosis of the vena cava involving first one renal vein and then the other with resulting infarction of the kidneys, which was the first and presenting symptom in the case.

The lesions in the lungs were of some interest. Of course with a massive thrombosis of that sort one would expect some pulmonary emboli. There were a large number of small emboli, though no massive ones. The majority of the lesions in the lung were infarcts, though there were patches of pneumonia there as well.

Dr. Hampton: Were these linear shadows in the x-rays infarcts, do you suppose?

Dr. Mallory: I think probably. We did not notice any marked thickening of the interlobar septum.

DR. HAMPTON: Was there any collapse?

DR. MALLORY: There was marked collapse of the entire right lower lobe.

DR. HAMPTON: How long after those films were taken was it that the patient died?

DR. MALLORY: She died on the thirtieth of December.

DR. HAMPTON: Six days after this film was taken. She must have had some infarcts there then.

DR. MALLORY: I was interested from the point of view of diagnosis to know at what stage cancer of the stomach was first very definitely suspected. Wasn't it when the liver was felt?

DR. LUDWIG: We suspected it from the start. She had a vague story of epigastric distress which did not sound at all characteristic of ulcer. We could not differentiate absolutely, but from the time we first saw the patient we suspected she might have cancer.

DR. MALLORY: She was too sick to be put through a gastro-intestinal examination, of course.

DR. LUDWIG: Yes.

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SURVEY OF HOSPITALS FOR NERVOUS AND MENTAL PATIENTS

IN the *Journal of the American Medical Association* for March 5 appears the preliminary report of the survey of hospitals for nervous and mental patients in the United States, conducted by the Council on Medical Education and Hospitals, as directed by the House of Delegates at its annual meeting in 1930. Two major procedures were employed by the Council in its investigation: the questionnaire and the personal visit. Of 561 institutions listed, questionnaires have so far been answered by 416. Personal visits have been made to 353 of these institutions.

The results so far indicate that of the government-owned groups the Veterans' Administration hospitals are on the whole comparatively new and well-equipped, have relatively large medical staffs, and apparently give the individual patient good custodial and therapeutic care. Among county and city institutions, the majority visited were found to be purely custodial in care. In state hospitals, which are nearly three times as numerous as all federal, county and city institutions, overcrowding is almost universal, in several instances being carried to a deplorable extreme.

Private institutions fall into two classes: the sanatoriums and the rest homes, the latter, while they meet a real need, being mainly custodial. Nearly all sanatoriums were found to be clean, orderly and apparently well conducted, returning a comparatively large percentage of their patients to active civil life.

In thus investigating these hospitals in order to obtain "a more accurate knowledge of the situation," and to point out "the need of further developments," the American Medical Association is performing one of its most useful functions.

ANOTHER "QUESTIONNAIRE"

MANY physicians have undoubtedly received and quite properly relegated to their waste-paper baskets a so-called questionnaire emanating from the National Anti-Vivisection Society. The only legitimate question raised by this apparent attempt to elicit information is, when is a questionnaire not a questionnaire? The answer is, when it attempts only to serve a selfish purpose, and, by the wording of its questions, to entrap the honest answerer into statements which do not represent his true opinion; by the putting of direct questions to which a direct answer cannot convey the whole truth. This type of questionnaire is not a true questionnaire for it seeks deliberately to distort the truth; it is fundamentally dishonest. Thus question eight, "Will you guarantee that the use of serum antitoxin, or any other similar preventive method, or cure, will have no harmful effects?" and question eleven, "Will you guarantee that vaccination will have no harmful after effects?" are unfair questions, unworthy of any honest seekers after truth and are obviously not designed to elicit the whole truth and nothing but the truth. Under the circumstances, the only dignified answer which such a set of questions can command is that of silence and if such a silence is sometimes contemptuous, at least it is not contemptible.

The form letter which accompanies this crude questionnaire is not even clever, and for that there is no excuse, for there is no excuse for bungling an attempt at finesse. The second and third paragraphs literally leap from the page as models of muddle-headedness.

"Physicians everywhere are complaining of decreased practice and income, irrespective of professional experience, on account of the increasing tendency of the public to seek the services of chiropractors, osteopaths and other healing agencies in place of physicians of the regular school.

"Has it occurred to you that the cause for this loss of practice and of financial returns is the natural indignation of all fair-minded people at the revolting cruelties to conscious, defenseless animals, especially to dogs—those loving, loyal friends of man—which are practiced in laboratories and colleges throughout this country."

A shrewd, foul blow in the pocketbook. But enough of this—perhaps too much. We must respect the transparent sincerity of the anti-vivisectionists, the anti-vaccinationists and the medical liberty leaguers even as we deplore the fatal blind spots which spread over such an alarmingly large area of their retinas. To argue with them is to argue with the babbling brook; to wrestle with them is to wrestle with water.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

LAHEY, FRANK H. M.D. Harvard University Medical School 1904. F.A.C.S. Director, Lahey Clinic. Surgeon-in-Chief to New England Baptist Hospital. Surgeon to the New England Deaconess Hospital. His subject is Transplantation of the Ureters Into the Rectum. With a Report of Five Cases. Page 875. Address: 605 Commonwealth Avenue, Boston.

OSBORN, STANLEY H. C.P.H., M.D. Tufts College Medical School 1914. State Commissioner of Health of Connecticut 1922-. His subject is Problems and Opportunities in Public Health and the Relation of Practicing Physicians Thereto. Page 877. Address: State Department of Health, Station A. Box K., Hartford, Connecticut.

NELSON, N. A. B.S., M.D. Long Island College Hospital, Brooklyn, New York 1926. Epidemiologist in Charge of Venereal Disease Control, Massachusetts Department of Public Health. Assistant Physician, Department of Dermatology and Syphilology and Junior Assistant Surgeon, Department of Gynecology, Boston Dispensary. Acting Assistant Surgeon, United States Public Health Service. Address: 546 State House, Boston. Associated with him is

ANDERSON, GAYLORD W. A.B., M.D. Harvard University Medical School 1928. Director, Division of Communicable Diseases, Massachusetts Department of Public Health. Address: 546 State House, Boston. Their subject is Reported Gonorrhea and Syphilis in Massachusetts in 1931. Page 882.

WILSON, JAMES L. A.B., M.D. Harvard University Medical School 1926. Instructor in Pediatrics, Harvard University Medical School. Junior Assistant Physician, Children's and Infants' Hospitals. His subject is Acute Anterior Poliomyelitis. Treatment of Bulbar and High Spinal Types. Page 887. Address: 300 Longwood Avenue, Boston.

GRANT, W. H. M.D. Harvard University Medical School 1896. Instructor in Gynecology, Tufts College Medical School. Surgeon, Gynecological Department, The Boston Dispensary. Address: 520 Commonwealth Avenue, Boston. Associated with him are

ZIBEL, N. M.D. Tufts College Medical School 1926. Research Fellow in Pathology and Bacteriology at Tufts College Medical School. Address: 311 Commonwealth Avenue, Boston. And

MACMAHON, H. E. B.A., M.D. University of Western Ontario 1925. L.M.C.C. Licentiate of Medicine, Council of Canada. Professor of Pathology and Bacteriology, Tufts Medical and Dental Schools (on leave of absence). Their subject is Use of the Rabbit in the Aschheim-Zondek Test for Pregnancy. Page 893.

RICE, ALLEN G. A.B., M.D. Harvard University Medical School 1905. F.A.C.S. Visiting Surgeon, Springfield Hospital. His subject is The Springfield Isolation Hospital. Page 898. Address: 33 School Street, Springfield, Mass.

AUSTIN, A. E. A.B., A.M., M.D. Harvard University Medical School 1887. Professor Emeritus, Tufts College Medical School. Physician Emeritus, Boston Dispensary. His subject is Progress of Gastroenterology in 1931. Page 901. Address: 270 Commonwealth Avenue, Boston.

MISCELLANY

THE POSSIBILITY OF AN EFFECTIVE ATTACK ON THE PNEUMONIA GERM

A message from the Rockefeller Institute for Medical Research in San Francisco suggests the possibility that pneumonia germs may be attacked successfully through the destruction of the capsule which seems to be composed largely of a soluble sugar-like substance as explained by Dr. Oswald T. Avery. He suggests that each of the different types of pneumonia produces its own specific substance, that the sugar is probably not a poison like the poison produced by the diphtheria germ, but does seem to hinder recovery from the disease, because it tends to bind certain protective substances in the blood and thus to prevent their reaching areas of infection. There is no power in the human body to break down this sugar capsule although a micro-organism has been found in peat soil which does produce an enzyme potent in the destruction of the germ. This has been demonstrated in dealing with mice infected by the pneumonia germ. Further application of this discovery together with the suitable serum treatment for the various types of pneumonia may lead to some valuable advances.

DR. G. K. COONSE WILL COME TO BOSTON

Dr. G. Kenneth Coonse has resigned his position as Professor of Orthopedic Surgery at Missouri University and will come to Boston. He has accepted a position on the Harvard Medical School Staff.

He was graduated from the Medical School of Harvard University in 1924.

AN HONOR TO MISS ANNIE W. GOODRICH

A special dispatch from San Antonio, Texas, to the *New York Times* states that the Walter Burns Saunders Medal, awarded each year to the nurse who has rendered the most praiseworthy service to the profession, was presented April 12, 1932, to Miss Annie W. Goodrich, dean of the Yale University School of Nursing before more than 2,000 delegates of the National League of Nursing Education and the National Organization for Public Health Nursing.

Presentation was made by Dr. Edward H. Carey, President-Elect of the American Medical Association, who explained that the medal was awarded to Miss Goodrich because of her activities for the betterment of the profession.

MORTALITY RATES

Telegraphic returns from 85 cities with a total population of thirty-seven million for the week ending April 9 indicate a mortality rate of 12.7 as against a rate of 13.2 for the corresponding week of last year. The highest rate (24.9) appears for Utica, N. Y., and the lowest (6.7) for Akron, Ohio. The highest infant mortality rate (11.5) appears for New Bedford, Mass., and the lowest for Knoxville, Tenn., Seattle, Wash., Somerville, Mass., and Wilmington, Del., which reported no infant mortality.

The annual rate for 85 cities is 12.7 for the fourteen weeks of 1932, as against a rate of 13.9 for the corresponding period of the previous year.

A RECEPTION TO DR. JAMES A. KEENAN AND ELECTION OF OFFICERS OF THE BOSTON SCHOOL PHYSICIANS' ASSOCIATION

A reception and dinner was tendered to Dr. James A. Keenan, recently appointed Director of School Hygiene, on April 13, at the Copley-Plaza Hotel.

A reorganization of the Boston School Physicians' Association immediately preceded the dinner. The following officers were elected: Dr. Charles F. Stack of Hyde Park, President; Dr. Edward Timmins of South Boston, Vice President; Dr. Mary Moore Beatty of Brighton, Secretary and Treasurer.

Dr. James A. Keenan addressed the Association stressing the importance and value of organization and pledged his coöperation in every way to help school physicians. Emphasis was placed on the importance of care of the age group ten to fifteen years. A survey of this age group is now being made and an interesting report is expected soon.

HOMAGE TO A GENERAL PRACTITIONER

BY P. E. TRUESDALE, M.D.

On April 6, a complimentary dinner was given in honor of Dr. Frank A. Hubbard of Taunton on his eightieth birthday.

Inspired by his admiring friends of whom Dr. Hubbard has an uncommon number, it was a fitting expression of their esteem. The gathering was large. An air of reverence was apparent. A well-deserved regard was freely extended Dr. Hubbard because he represents one of our country's cherished institutions, the General Practitioner. Although his school is no less respected and not likely to disappear, obviously it is passing from its time-honored position of influence and authority. Because of the many exemplary virtues it has taught those who have knelt at its altar, we cling with child-like veneration and love to those of its exponents now living. They represent its immemorial charm, its traditional brand of manly mettle, and its benevolent parental solicitude. It might well be said that Dr. Hubbard is of that medical family, the members of which have descended from Edward Augustus Holyoke of Salem, Nathaniel W. Appleton of Boston, William Baylies of Dighton, David Cobb of Taunton, John Warren of Boston, Oliver Prescott of Groton, and Charles Jarvis of Boston, all incorporators of the Massachusetts Medical Society in 1781.

In line, one or more of these were the preceptors of Nathan Smith, John Brooks, Henry Wells, James Jackson, Nathaniel Bradstreet, Benjamin Waterhouse, and John C. Warren, who, in their turn, were the teachers of John Jeffries, Z. B. Adams, Enoch Hale, Jacob Bigelow, Ebenezer Alden, D. Humphries Storer, Robert Thaxter, John Homans, Oliver Wendell Holmes, John Appleton, George W. Otis, Benjamin F. Heywood, and John Ware, who, in turn, taught:

Fred Shattuck, Robert W. Greenleaf, Francis H. Williams, Reginald Fitz, Malcolm Storer, Edward Reynolds, Alfred Worcester, James J. Putnam, Francis Watson, Harold C. Ernst, Joseph Goodale, James C. White, Thomas H. Gage, David Cheever, and Frank A. Hubbard, who, among others, shared in the development of a medical family tree, the achievements of which have rarely been surpassed in the history of medicine.

When it can be said of a Doctor that the members of his community have trusted and loved him, that the profession has recognized him as the noblest type of physician, then it seems appropriate for him to unlock the gate, let us in to gather around and listen to his story of how he planned that fair field of the future of which so many dream and so very few ever reach.

Of one thing we are sure. No accident ever carries a man to this position. Nature must endow him with intelligence, character, and common sense. He must love his profession. To Dr. Hubbard, it is occupation enough to apply at the bedside, the best of all that he knows for the good of his patient.

I have noticed him,—gentle, thoughtful, calm, absorbed in the case before him, never looking for tribute, but earnestly searching out the cause of symptoms and a way out of difficulties. He studies a clinical problem from basic principles. He keeps an open mind, weighing laboratory information for what it is worth. Like the dependable navigator, what he can see, hear, and feel, means more to him than some variation in the weatherglass.

With a practice that began in the early 80's, Dr. Hubbard has mingled with three generations of doctors and thus his career becomes an engaging subject for reflection. His early contacts were with men who spent much of their time in learning how to learn, how to move, how to look, and how to feel. They had many drugs, but used very few. They depended much upon fresh air and water, sleep and watching, motion and rest, the retentions and excretions, and the mental picture. From what I can learn, they held more rigidly to principles. They were punctual and precise. Whenever possible, their day's work was planned. They did not say "about so much," or "about so often," and "about so long". With their patients, they invariably left directions that were simple and definite. From contacts with such men, Dr. Hubbard acquired and maintained an attitude of modesty, a habit of caution, a manner of simplicity, and a spirit of sincerity. What has been the nature of his contacts with my contemporaries and with the younger set in practice? Has he refused to recognize them or consult with them because of their youth, their lack of experience, or their debonair manners? Indeed, no! He has been a postgraduate teacher, patient, charitable, and helpful.

In a community of this size, there is probably no other agency which means so much to its people as a good physician; one who sets a high standard for medical practice. Where there is one wholesome model, others develop. In his example and his contacts, a leader can be a preceptor, yes, virtually a medical school in himself. To me, that is very apparent in Taunton. Every man with whom I have come in contact conducts his practice with high purpose. The best interests of the patient is always a primary consideration. This fine spirit is not indigenous; it is set by men. It is something not deliberately taught. It is example, not precept. Let a model physician practice in a community and live long enough, the wholesome effect upon others is made apparent.

It was a physician of this type that Dr. Oliver Wendell Holmes used as a model in a lecture before his class at the Medical School on November 6, 1867. He employed the term "Medical Father" as applied to Augustus W. Holyoke, the preceptor of the much revered James Jackson.

Your Medical Father is the doctor you think of when you are in trouble. You go to him for his knowledge, his experience, his common sense, his sympathy, advice, and often for his protection.

On the natural history side, medicine is a science, but on the curative side, it is chiefly an art. So your Medical Father and mine has been the bedside physician such as Dr. Hubbard.

I can think of no more expressive tribute to Dr. Hubbard than the few lines Oliver Wendell Holmes wrote about his own bedside physician and Medical Father, Dr. James Jackson:

"Such is the visit that from day to day
Spreads o'er my chamber its benignant ray:
I give his health who never cared to claim
Her babbling homage from the tongue of fame.
Unmoved by praise, he stands by all confessed,
The truest, noblest, wisest, kindest, best."

CORRESPONDENCE

THE RESTORATION OF THE LICENSE TO PRACTICE OF CHARLES GRAPEK, M.D., D.O.

Editor *New England Journal of Medicine,*

Dear Sir:

This is to inform you that on April 14, 1932, the Board of Registration in Medicine, *Voted:* to restore to Charles Grapek, M.D., D.O., his license to practice in Massachusetts, which had been revoked on April 2, 1931.

Very truly yours,
STEPHEN RUSHMORE, M.D., *Secretary.*

CAMPS FOR DIABETIC CHILDREN

April 21, 1932.

Editor,
New England Journal of Medicine.

Five camps in New England will have adequate facilities for the care of diabetic children during the summer of 1932.

The first of these camps was founded in Ogunquit, Maine, in 1925, by Mrs. Elizabeth Devine, a graduate nurse of the New England Deaconess Hospital. She has accommodations for the care of 20 diabetic girls at one time or 50 during the season. This camp is a private camp, but is subsidized to a limited extent.

A new camp for girls, the Clara Barton Camp for Diabetic Children, has been placed at Dr. Joslin's disposal this year by the Clara Barton Birthplace Committee and the Universalist Church. This is located in Oxford, Mass., and here 56 children may be cared for during the season.

We would feel hesitant about sending diabetic children to summer camps unless assured of experienced nursing and dietetic supervision. With the coöperation of Miss Mabel McVicker, Superintendent of Nurses at the New England Deaconess Hospital, in selecting nurses, Miss Hazel Hunt in selecting laboratory technicians for the Clara Barton Camp, and Miss Hilda French in selecting the dietitians, we are sure of adequate care and have felt it duty bound to announce through the *New England Journal of Medicine* to New England physicians that such an opportunity exists for any of their diabetic children whom they wish to recommend.

Two of New England's finest camps for girls and one for boys will have nurses especially trained in diabetic work so that diabetic children can have adequate supervision. One has offered us three places for the season without charge, these have already been taken, but it will be possible to send others who wish to pay the regular rates.

Application for Mrs. Devine's camp may be made directly to her in Ogunquit, Maine. Applications for the Clara Barton Camp may be made to me, and I will also be glad to send information concerning the other three camps.

Sincerely yours,

PRISCILLA WHITE, M.D.

81 Bay State Road, Boston.

ATTENDANCE AT PUBLIC MEETINGS OF ACHIEVEMENT WEEK

The Commonwealth of Massachusetts
Department of Public Health
315 Ford Building
15 Ashburton Place
Boston

April 20, 1932.

Editor,
New England Journal of Medicine,

The public meetings during Achievement Week of the cancer program were attended by approximately 3500 people. The following shows the attendance in the various communities:

Boston	1200
Brockton	200
Fitchburg	150
Gardner	500
Lawrence	60
Lowell	400
Lynn	200
New Bedford	300
North Adams	150
Pittsfield	60
Springfield	100
Worcester	125

Very truly yours,

HERBERT L. LOMBARD, M.D.,
Director, Division of Adult Hygiene.

AN INVITATION TO VISIT CLINICS AND LABORATORIES IN RUSSIA

April 21, 1932.

Editor,
New England Journal of Medicine,

An invitation has been extended to American physicians and surgeons by the Medical Association of Leningrad, Moscow, and other cities of Soviet Russia, to visit their hospitals, clinics, research laboratories and similar institutions.

This is the first occasion ever offered the American physicians to inspect officially these most interesting phases of Russian medical life.

The group of American physicians which is now forming will sail this summer.

Those interested can get full information from Compass Tours, 55 West Forty-second Street, New York City.

CONRAD K. GALE, M.D.

RECENT DEATH

RICHMOND — DR. IVUS I. RICHMOND died at the Goddard Hospital on April 8, 1932, at the age of sixty-two. He was born in Byron, Maine, and graduated from the Kent Hill Seminary in 1898 and from the Medical School of Harvard University in 1902. After an interne service at the Carney Hospital he entered upon practice in East Bridgewater continuing there until his death. He was a member of the Plymouth District Medical Society and the Massachusetts Medical Society.

In addition to an active practice Dr. Richmond was interested in social and civic affairs, having been a member of Satucket Lodge, A. F. and A. M., the Colfax Lodge, I.O.O.F., the East Bridgewater Grange and the Trinity Episcopal Church.

In 1905 he married Miss Frances Stewart who survives him together with three daughters, one son, three sisters and two brothers.

He had served on the local board of selectmen for several years, the school committee and the board of public welfare.

NOTICES

A SEMINAR ON MENTAL ADJUSTMENT

Dr. F. L. Wells, Director of the Psychological Laboratory in the Boston Psychopathic Hospital, will conduct a seminar on "Mental Adjustments" at the State Hospital for Mental Diseases, Howard, Rhode Island, during the month of May.

AMERICAN MEDICAL GOLFERS PLAY IN NEW ORLEANS, MAY 9

The American Medical Golfing Association will hold its Eighteenth Annual Tournament in New Orleans on Monday, May 9, 1932. The thirty-six hole match will be played over the beautiful and interesting New Orleans Country Club course, followed in the evening by the golfers' banquet and distribution of prizes. Approximately fifty trophies and prizes will be distributed to winners in the various events.

The membership of the A. M. G. A. now totals 850 physicians, representing every state in the Union. It is anticipated that 150 medical golfers will be attracted to New Orleans for this year's tournament.

Dr. Frank A. Kelly of Detroit is President of the American medical golfers, Dr. Homer K. Nicoll of Chicago is First Vice-President, and Dr. John Welsh Croskey of Philadelphia is Second Vice-President. The local committee in charge of arrangements at

New Orleans is composed of Dr. J. P. O'Kelley, Chairman, Drs. L. R. DeBuys, Lucian A. Fortier, Val H. Fuchs, J. P. Leake, W. W. Leake, Louis Levy, Walter E. Levy, J. T. O'Ferrall, D. N. Silverman and Arthur I. Weil.

Fixed competition for thirty-six holes includes low gross, low net, choice score handicap, and kickers' handicap. Eighteen-hole events include low gross, low net, maturity (limited to Fellows over sixty years of age), and the "oldguard" (limited to competition of past presidents). The Mayor of the host city is always invited to present the trophy for kickers' handicap.

Invitations to attend the American Medical Golfing Association tournament in New Orleans are being sent to members from the Executive Office in Detroit. Any male Fellow of the American Medical Association in good standing is eligible to membership in the Golfing Association. Physicians are invited to become associated with this active social organization, which offers much in good sportsmanship and friendship. Applications may be procured by writing Bill Burns, Executive Secretary, 4421 Woodward Avenue, Detroit, Michigan.

REMOVALS

David Ayman, M.D. announces the removal of his office from 484 Commonwealth Avenue, Boston, to the Pasteur Building, 371 Commonwealth Avenue, Boston.

M. Falcon Lesses, M.D. announces the removal of his office from 484 Commonwealth Avenue, Boston, to the Pasteur Building, 371 Commonwealth Avenue, Boston.

Aaron Feldman, M.D., announces the removal of his office from 484 Commonwealth Avenue, Boston, to 636 Beacon Street, Boston.

ANNOUNCEMENT

John B. Sears, M.D., announces the opening of an office at the Longwood Medical Building, 319 Longwood Avenue, Boston.

THROUGH CAR TO NEW ORLEANS MAY 7, 1932

Dear Doctor:

I take pleasure in advising that the Southern Railway is arranging to operate a special through sleeping car from Boston to New Orleans, La., without change, for members and their wives attending the meeting of the American Medical Association, on the following schedule:

Lv. Boston—12:00 Noon—May 7.
Lv. Providence—1:04 P. M.—May 7.
Ar. New Orleans—7:55 A. M.—May 9.

We can arrange to make reservations in this through car for you either from Boston or Providence, and in order that you may avail yourself of excellent accommodations, should you desire to travel in this car, it is our suggestion you make your reservations as promptly as possible.

If, however, you desire to travel via some other schedule and date, we will be very glad to attend to your arrangements via any schedule.

Yours very truly,
CLAUDE T. HUNT,
New England Passenger Agent,
Southern Railway.

A CORDIAL INVITATION FROM THE MASSACHUSETTS DENTAL SOCIETY TO THE MEMBERS OF THE MASSACHUSETTS MEDICAL SOCIETY

Office of the President
March 22, 1932.

Dr. Walter L. Burrage,
182 Walnut Street,
Brookline, Massachusetts.

Dear Dr. Burrage,

The Massachusetts Dental Society extends a cordial invitation to the members of the Massachusetts Medical Society to attend the lecture by Dr. E. V. McCollum of Johns Hopkins University on "The Application of Nutritional Science in Daily Life" to be held at the Hotel Statler, Georgian Room, on Tuesday, May 3, at 8 P. M.

This lecture is a feature of the program of the Sixty-eighth Annual Meeting, Hotel Statler, Boston, May 2, 3, 4, 5, 1932.

Very truly yours,
WM. H. GILPATRIC,
President Massachusetts Dental Society.
March 23, 1932.

Dr. William H. Gilpatric, President
Massachusetts Dental Society,
538 Commonwealth Avenue, Boston.

Dear Dr. Gilpatric,

Thank you for your polite invitation to the Fellows of the Massachusetts Medical Society to attend the lecture by Dr. E. V. McCollum on "The Application of Nutritional Science in Daily Life" to be given in the Georgian Room of the Hotel Statler, May 3, 1932, at 8 P.M.

I am sending your letter to the official organ of the Massachusetts Medical Society, the *New England Journal of Medicine*, for publication in an early issue.

Faithfully yours,
WALTER L. BURRAGE, *Secretary.*

RADIO HEALTH MESSAGES

MAY-JUNE, 1932

Sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

Courtesy WBZ. Tuesdays, 4:20 P.M.

May

3 Physical Culture in School Children
10 The Dangers of Being Fat
17 The Deaf Child
24 Medical Care
31 Growth and Development

June

7 Prenatal and Maternity Service
14 New Findings in Oral Hygiene
21 Community Public Health
28 Communicable Diseases

STATE HOUSE BROADCAST

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays, 12:30 P.M.

Health matters of public interest discussed by the Division Directors of the Department.

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI. Fridays, 4:50 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

REPORTS AND NOTICES OF MEETINGS

SUFFOLK DISTRICT MEDICAL SOCIETY

CLINICAL MEETING

A clinical meeting of the Suffolk District Medical Society was held in the New England Deaconess Hospital on Wednesday evening, March 30. Dr. Leland S. McKittrick presided.

Dr. Lyman Richard described "Two Interesting Foreign Bodies in the Upper Air Passages." A four-year-old boy was sent to the Children's Hospital with the diagnosis of appendicitis, having vomited nine days previously and having complained of abdominal pain and distention for five days. Abdominal examination was negative but examination of the chest showed diminished expansion on the left, dullness and diminished breath sounds over the left lower lobe, and hyperresonance over the left upper lobe. His temperature was 103° on admission. He was treated as a pneumonia patient for the next nine days but the symptoms and fever remained essentially unchanged. The parents then recalled that he had choked on a peanut shortly before the onset of symptoms eighteen days before. X-rays were then taken at the extremes of inspiration and expiration. The former plate showed hyper-aeration of the left apex which was only slightly decreased in the latter. At bronchoscopy Dr. Richards found a fragment of peanut lodged in the left main bronchus acting as a ball-valve. It was easily removed with almost immediate relief of symptoms and return of the temperature to normal. The temperature in these cases is probably due to absorption of a toxic substance formed by decay of the peanut.

A two-year-old boy was brought to the Children's Hospital because of wheezing for two weeks. The parents denied all possibility of foreign body inhalation. However physical examination and x-rays were similar to the previous case and at bronchoscopy Dr. Richards, as in the case cited above, found a piece of nut in the left main bronchus.

Dr. Elliott P. Joslin spoke on "Diabetic Economics." During the past few months Dr. Joslin has been advising a week-end hospital visit for some of his diabetic patients especially for students, teachers, and business or professional men. During the two days they receive an intensive course of instruction in their disease and also have their diets and insulin dosage regulated. The method is also valuable in the home for those patients who are unable to come to the hospital.

Gangrene is a costly complication of diabetes that usually is preventable through proper care of the feet. But from a purely monetary standpoint a sore toe is frequently even more expensive, for its treatment may require months of hospitalization. Coma, also, is a preventable complication but greatly increases the financial burden of the diabetic. The diabetic patient who is closely followed by his personal physician avoids complications, saves money, and prolongs his life.

Dr. Howard F. Root discussed "The Increasing Incidence of Pernicious Anemia in Diabetes Mellitus and Their Relation to One Another." Although pernicious anemia and diabetes mellitus are both common their occurrence together has been emphasized only rarely. A year ago Dr. Root found thirty-five cases reported in the literature and added thirteen cases seen at the New England Deaconess Hospital. Since then, however, he has found ten more patients with pernicious anemia among 1093 consecutive diabetics. This increasing incidence may be due to the prolongation of life in both diseases by modern therapeutics, to better diagnosis or to some unknown relation between the two diseases. A family history of the disease was obtained in thirteen per cent of the patients with pernicious anemia and in thirty-three per cent of the diabetics. The sex incidence of pernicious anemia among diabetics is about equal in contrast to the usual predominance of males in this disease. Diabetes preceded pernicious anemia in the great majority of the cases. The symptomatology is the same as in uncomplicated pernicious anemia except that there is a marked preponderance of central nervous system involvement among this group of patients. Thus, six of the ten patients seen during the past year had combined nervous system disease. The diagnosis is not always easy because many diabetics have a moderate anemia. Response to liver therapy is prompt in these patients as in uncomplicated pernicious anemia.

Dr. Root also discussed a group of border-line cases in whom an absolute diagnosis of pernicious anemia cannot be made. These patients have a moderate anemia, color indices of approximately one, and either decreased or absent hydrochloric acid in the gastric juice. The response to liver therapy is definite but not so marked as in cases

of undoubted pernicious anemia. Two patients in this group were presented. The first had a red count of 3,000,000, a hemoglobin of 60 per cent, and no free acid in the gastric secretions. The other had a red count of 2,900,000, a hemoglobin of 55 per cent, and reduced gastric acidity. In both cases liver therapy was followed by a reticulocyte rise to four per cent, a rise in the red count, and definite clinical improvement.

Dr. Millard Smith presented two cases. Three years ago a thirty-five-year-old man complained of lowered vitality and loss of weight for a period of six months associated with a generalized enlargement of the lymph nodes. Roentgen examination revealed enlargement of the mediastinal nodes. A clinical diagnosis of Hodgkin's disease was made but biopsy proved that the lymphadenopathy was tuberculous. He was treated with ultraviolet light for several months and made a rapid and apparently complete recovery and is now perfectly well.

A forty-four year old woman who was neurotic had had diabetes for a number of years but had never followed her diet carefully. Two days before entry she began to vomit and her physician discontinued her insulin and prescribed a preparation of bismuth. She continued to vomit and was brought to the hospital markedly dehydrated but fully conscious and showing only slight hyperpnea. The blood sugar was 640 milligrams per cent, the sodium chloride was 565 milligrams per cent, and the carbon dioxide combining power of the blood was reduced to eight volumes per cent. During the next eight hours she received 130 units of insulin. The lowered blood chlorides and the acidosis were thought to be largely the result of depletion of the alkali reserve by the vomiting and not a true diabetic acidosis. Consequently she was given five liters of normal saline by hypodermoclysis and also fifteen cubic centimeters of fifteen per cent sodium chloride intravenously during the night. Sixteen hours after entrance to the hospital the blood sugar had fallen to 250 milligrams per cent, the carbon dioxide combining power had risen to 48 volumes per cent, and she was able to eat an ordinary breakfast. No reason for the original vomiting was established. Dr. Smith believes that the administration of relatively large amounts of salt materially hastened recovery in this case.

Dr. G. G. Smith spoke on "Cancer of the Prostate." At present there are five common methods of treating this condition. Simple cystotomy relieves obstruction but is often painful and always distressing for the patient. Interstitial radiation with radium seeds or needles gives excellent results in some cases especially when the radium is inserted under direct vision through a suprapubic opening. Partial perineal prostatectomy with removal of the obstructing portion affords temporary relief for periods varying from a few months up to two years. A promising method is the removal of the obstructing portion by diathermy through an ordinary endoscope, repeating the operation as frequently as obstruction recurs. Finally, total prostatectomy may be done in those cases in which there are no distant metastases and the tumor has not broken through its capsule locally. After the prostate is removed the bladder neck is sutured to the divided urethra and if the nerves have been preserved the voluntary external sphincter takes on an involuntary function as well and the patient has little or no incontinence. Moreover recurrences do not cause obstruction as they do with any other type of treatment.

Dr. Smith presented two patients. The first man was seen at the Massachusetts General Hospital two and a half years ago at which time he had a large carcinoma of the prostate but no serious obstruction. In spite of deep x-ray therapy he developed obstruction, however, and it became necessary to do a suprapubic cystotomy. As this gave him a great deal of pain he was transferred to the Palmer Memorial Hospital where ten platinum needles were inserted into the tumor and a total of 2900 millicurie hours of radiation given. The suprapubic wound was easily closed and he has now had good bladder function for over a year.

The second patient was first seen at the Massachusetts General Hospital three years ago at which time he had complete retention. The prostate was enlarged, nodular, and hard but definitely encapsulated and suitable for total prostatectomy. Dr. Smith removed the entire gland at that time. The patient was incontinent for several months but eventually regained almost complete control. At present there is no evidence of recurrence although the pathologic report was rapidly growing adenocarcinoma.

Dr. Howard M. Clute spoke on "Hyperthyroidism and Heart Failure." The majority of patients who develop cardiac failure during thyroid toxicity have secondary hyperthyroidism on the basis of a preexisting adenomatous goitre. This does not mean that there is any fundamental difference between primary and secondary hyperthyroidism because the former is more frequent in young patients and the latter in middle-aged or even old individuals. Consequently secondary toxicity adds a load to a heart that has begun to feel the effects of age and is unable to handle the added work demanded by the increased metabolism. When primary hyperthyroidism occurs in a young individual with rheumatic heart disease decompensation is very apt to develop.

A fifty-five year old man had had a large goitre in the right side of his neck for many years. Six months ago he developed symptoms of toxicity and began to lose weight. Three months ago he noticed that his heart beat had become rapid and irregular. Physical examination shows a large goitre in the right side of the neck and a small one in the left which extends down behind the clavicle. X-rays show a large intrathoracic goitre on the left which displaces the trachea to the right and anteriorly. The heart is fibrillating but there is no decompensation. He will be treated by rest and with iodine

until ready for operation. If the heart does not become regular in a few days he will also receive digitalis before operation and if the fibrillation persists after the operation he will then receive quinidin. With this routine a normal rhythm is obtained in nearly all cases.

Dr. Richard B. Cattell spoke on "Cancer of the Colon and Rectum." Eighteen months ago a man of thirty-five years had diarrhea associated with some rectal bleeding which his physician attributed to hemorrhoids. However, he continued to pass bright red blood with nearly every bowel movement for the next six months when he had a second period of diarrhea lasting for two weeks. Rectal examination showed a few small hemorrhoidal tabs and a large hard polypoid tumor with a broad pedicle situated on the posterior wall of the rectum three inches above the anus. A loop colostomy was done and seventeen days later the rectum was removed by a posterior resection. The pathologic diagnosis was adenocarcinoma, grade II. The patient is now leading an active life without any serious handicap from his colostomy and there is no evidence of recurrence.

The cancer in this case probably originated in a broad based benign polyp. The case illustrates the not infrequent occurrence of rectal cancer in young persons. During 1930 Dr. Cattell saw four patients under thirty years of age with cancer of the rectum, two of whom were inoperable.

Cancer of the colon in the absence of obstruction is best treated by resection with direct anastomosis of the divided bowel, according to Dr. Cattell. When there is obstruction a preliminary colostomy is advisable. In many cases Dr. Cattell prefers the Mikulicz type of resection. For cancer of the rectum many surgeons prefer the combined abdominal perineal resection in one stage but Dr. Cattell advises a loop colostomy followed by posterior resection after two weeks. This method is especially valuable with tumors of low malignancy situated near the anus.

Dr. Sara Jordan discussed "The Differentiation of Gastric Ulcer and Gastric Cancer." The history in cancer is rarely longer than one and a half years and the pain is usually not periodic, not definitely related to meals, and not relieved by food or alkalies in contrast to typical ulcer pain. In cancer there is usually a low or decreased gastric acidity while in ulcer it is normal or increased. Occult blood is always present in the stools in cancer cases at some time and is rarely absent for more than a few days at a time. It may also be present in ulcer but usually disappears under adequate medical treatment and remains absent for weeks at a time. Failure to do so in a suspected ulcer case is very suggestive of malignancy and Dr. Jordan believes that an exploratory laparotomy is indicated in such cases. In most cases the x-ray is of great value but it must not be relied upon when in disagreement with the history and clinical findings.

Dr. Jordan presented several patients. A thirty-six year old woman was first seen in 1929 because of anorexia, nausea, loss of weight, and epigastric pain of a year's duration. A palpable epigastric tumor, gastric anacidity, and a filling defect involving the fundus and media of the stomach by x-ray established the diagnosis of cancer. Dr. H. M. Clute did a total gastrectomy on this patient in 1929 and she is now well with no evidence of recurrence.

A fifty-two year old woman was first seen in 1924 when she gave a history of recurrent attacks of typical ulcer pain over a period of twenty-five years. The gastric acidity was low, occult blood was present in the stools, and x-ray showed a large irregular niche in the lesser curvature, findings which definitely suggested cancer. However, the blood promptly disappeared from the stools on medical treatment and in six weeks the filling defect had also disappeared. She has now been well for eight years and repeated roentgen examinations have been reported as normal.

THE WILLIAM HARVEY SOCIETY

A meeting of the William Harvey Society of Tufts College Medical School was held in the Beth Israel Hospital on Friday evening, April 15. Dr. Mark H. Rogers, Professor of Orthopedic Surgery, Tufts Medical School, presided.

Dr. Fred H. Albee, Professor of Orthopedic Surgery, New York Postgraduate Medical School, spoke on the "Treatment of Intracapsular Fracture of the Hip." Fractures of the central or proximal portion of the neck of the femur heal poorly following any non-operative method of treatment. In a recent survey of this problem in this country it was found that in some large clinics primary union occurred in as few as thirty per cent of the cases. These fractures are either partially or completely intra-articular and all such fractures, as of the head of the radius and the carpal scaphoid, heal slowly. The cross section of the bone is smallest at the fracture line and it is a difficult fracture to immobilize. There is probably some inhibition to healing from the synovial fluid, mechanical, at least, and possibly a specific inhibitory action. The most important factor in the non-union is the poor blood supply especially of the proximal fragment as the entire supply of the femoral head is through a small vessel in the ligamentum teres.

The Whitman position with a double plaster spica gives splendid approximation and the best possible immobilization and if union then fails to occur it is very unlikely that further non-operative treatment will accomplish anything. For many years metal nails of all descriptions have been used with rather disappointing results in the hands of most workers. Dr. Albee believes that they should not be used as they act as a foreign body and cause absorption to the surrounding bone and frequently

do more harm than good. A bone graft peg, on the other hand, is physiologic, gives support to the fragments, stimulates bone formation, and acts as a pathway along which new vessels are able to extend to the proximal fragment. Dr. Albee especially emphasized the importance of using dowel shaped pegs fitting the drill hole with precision. If large or irregular pegs are driven into the drill hole there is compression of the adjacent bone and interference with the blood supply and the best results cannot be expected. The method gives excellent results in the large majority of cases.

Because of the high incidence of non-union following the non-operative treatment of fresh cases Dr. Albee now advises the bone-graft peg in the primary treatment of fracture of the neck of the femur. Dr. Albee showed moving pictures illustrating the technic and the results of the operation.

THE HARVARD MEDICAL SOCIETY

The regular meeting of the Harvard Medical Society was held in the amphitheater of the Peter Bent Brigham Hospital on April 12. Dr. Harvey Cushing presided.

The medical case was presented by Dr. Van Auken. A seventeen-year-old Polish girl entered the hospital complaining of edema of the feet, abdomen, face and hands of three weeks' duration. She had had none of the childhood diseases. She had been living in a cold room for the past year. Her present illness began with swelling of the feet, more marked at night. A physician diagnosed nephritis and put her to bed. Nevertheless the edema increased. There was oliguria with a highly concentrated urine.

Physical examination showed generalized edema, especially in the dependent portions of her body. Her hands and feet were cyanotic. Her eyegrounds were negative. There were a few carious teeth. The heart was displaced to the left by fluid in the right pleural cavity. The blood pressure was 140/100. There was moderate ascites. The red count was 5.0, the hemoglobin 110, the white count 10. The urine had a specific gravity of 1.028, a large trace of albumin, a few fine granular casts, but no red cells. The blood urea nitrogen was normal. The blood cholesterol was 660 mg. per cent, the blood protein 4.2 gm. per cent with a reversed albumin-globulin ratio.

She has been put on a 60-gram protein diet with the addition of 10-30 grams of protein autolysate; fluids have been limited to 850 cc. Urea and magnesium sulphate have been given because of increasing edema. The blood proteins reached a minimum of 3.4, but now have risen slightly. Red cells were found in the urine on one examination. Dr. Christian regards this as a case of glomerular nephritis exhibiting the nephrotic syndrome.

The surgical case was presented by Dr. Bishop. A forty-nine year old housewife complained of abdominal swelling of nine months' duration. Her past history is irrelevant. Her present illness began 15 months ago. At that time her menses began to recur every two weeks instead of monthly as before. Six months later menstruation ceased entirely. Her abdomen began to swell slowly. For two months before admission the patient had had abdominal distress after meals, nausea, vomiting, and moderate constipation. She had nocturia for two weeks before admission. She had lost no weight. She also gave a story of the appearance of a painless lump in her breast which appeared eighteen months ago and had slowly increased in size.

On entry she was found to be pale, and showed loss of subcutaneous tissue. Heart and lungs were negative. The left breast was involved by a massive carcinoma. There were axillary metastases. Her abdomen was greatly distended. The upper portion was dull, with a fluid wave, while the flanks were tympanitic. The viscera could not be felt. On vaginal examination the vaults appeared to be obliterated by a mass pressing down from above. The same mass could be felt by rectum. Proctoscopic examination showed no ulceration. The red count was 3.9, hemoglobin 80, the white count 12.0.

It was thought she had a carcinoma of the breast and a malignant cyst of the ovary. Abdominal exploration was done soon after entry. A large papillary tumor arising from the left side of the pelvis was removed with all the pelvic organs. Metastatic implantations were found on the abdominal wall. The operation was followed by x-ray treatment.

A few days ago a radical amputation of the left breast and dissection of the axilla was done. She is now convalescing.

Dr. Cheever said that this particular association of malignant tumors is not uncommon. The pathologic report of the abdominal tumor was papillary cyst-adenocarcinoma of the ovary, a type that responds well, after removal of the ovary, to radiation.

The address of the evening was given by Surgeon-General Robert U. Patterson. He spoke on "The Army Medical Corps as a Career and Its Relation to the Civil Profession."

He briefly sketched the history of the medical corps. It has played an important rôle in the progress of scientific and preventive medicine. Many famous names such as Rush, Brown, Beaumont, Reed, and Russell attest to its fame. Especially since the Spanish-American War it has prosecuted researches into disease. Many special groups have been organized for this purpose. A variety of significant work is now being done by these men.

General Patterson also summarized the advantages of a career in the medical corps. He emphasized the ample opportunity provided for medical study, the variety of clinical material, the pleasant life and valuable associations open to the enlisted man. The peace time strength of the Medical Reserve Corps should be 22,000 men. At present only about 8,500 are enrolled in this organization.

NEW ENGLAND PEDIATRIC SOCIETY

A MEETING TO DISCUSS THE RATIONAL USE OF THE VITAMIN PREPARATIONS IN PEDIATRICS, MAY 6, 1932

Afternoon Session

Children's Hospital Amphitheatre, 4:00 P.M.

1. Pathology of Vitamin A Deficiency—Dr. S. Burt Wolbach.
2. Is Dental Caries a Nutritional Disease?—Dr. Kurt H. Thoma, Professor of Dental Pathology, Harvard Dental School.
3. Arthritis—Dr. Frank Ober.
4. Recurrent Intussusception—Dr. Augustus Thorndike.
5. Demonstration of Patients—Dr. Kenneth Blackfan and Staff.

Evening Session

Boston Medical Library, 8:15 P. M.

1. Diet, Nutrition and Infection—Dr. Alfred Hess, New York.
2. Four Pertinent Questions—To be answered by Dr. Henry Utter, Warren Sisson, Joseph Garland and Karlton G. Percy.
3. Discussion: Opened by Drs. Richard M. Smith, Edwin T. Wyman and John Lovett Morse.
4. Refreshments.

Physicians and medical students invited.

THE WATERTOWN PHYSICIANS' SOCIETY

The regular monthly meeting of the Watertown Physicians' Society will be held on Monday evening, May 2, 1932, at 128 Mt. Auburn Street, 8:30 P.M.

The speaker will be Dr. Francis M. Findlay of the Massachusetts General Hospital.

Subject: Fractures of the Femur. Illustrated by lantern slides.

All interested physicians and friends are cordially invited to attend.

EUGENE F. GORMAN, M.D., *Secretary.*

THE NEISSERIAN MEDICAL SOCIETY OF MASSACHUSETTS

The fifth regular meeting of the Neisserian Medical Society of Massachusetts will be held on May 4, 1932.

9 A. M. Clinics will be held at the Boston City Hospital, the Boston Dispensary and the Massachusetts General Hospital.

8 P. M. Massachusetts General Hospital (lower amphitheater Out-Patient Department Building).

Business meeting.

Dr. Hans Zinsser, Professor of Bacteriology at the Harvard Medical School, will speak on the subject, "The Sanitary Control of Gonorrhea and the Future of Its Bacteriology."

Members of the medical profession are invited to attend.

OSCAR F. COX, JR., M.D., *Secretary.*

SOCIETY MEETINGS
CONGRESSES AND CONFERENCES

April, Autumn—International Postgraduate Courses in Berlin. See page 1169, issue of December 10.

April 28—The Annual Meeting of the Massachusetts Tuberculosis League. See notice on page 874, issue of April 21.

April 29—Massachusetts Psychiatric Society. See notice on page 874, issue of April 21.

April 29—Massachusetts Memorial Hospitals. See page 873, issue of April 21.

May 2—The Watertown Physicians' Society. See notice elsewhere on this page.

May 3—Lecture by Dr. E. V. McCollum (Massachusetts Dental Society). See page 918.

May 3 and 5—The Edward K. Dunham Lectures. See page 871, issue of April 21.

May 4—The Neisserian Medical Society of Massachusetts. See notice elsewhere on this page.

May 5—Mental Hygiene Conference. See page 873, issue of April 21.

May 5, 6 and 7—American Climatological and Clinical Association. See page 822, issue of April 14.

May 6—New England Pediatric Society. See notice elsewhere on this page.

May 6 and 7—The American Proctologic Society. See page 767, issue of April 7.

May 9—American Medical Golfing Association. See page 917.

May 9-13—American Medical Association, New Orleans, La.

May 10—American Heart Association. See notice on page 824, issue of April 14.

May 11 - June 1—New England Heart Association. See page 891, issue of October 29.

June 6, 7, 8, and 9—National Tuberculosis Association. See page 598, issue of March 17.

June 8, 9, 10—Massachusetts Medical Society, Hotel Statler, Boston.

June 21-24—Catholic Hospital Association. See page 369, issue of February 18.

July 10 - August 12—The Second Intensive European Summer Course in Surgery, Gynecology and Obstetrics. See page 714, issue of March 31.

September 19-22 — International Congress of Biliary Lithiasis. See notice on page 427, issue of February 25.

October 24-27 — American Public Health Association. See notice on page 1321, issue of December 31.

October 24-28—Inter-state Postgraduate Medical Association of North America. See page 39, issue of January 7.

DISTRICT MEDICAL SOCIETIES

Essex North District Medical Society

May 11—The next meeting of the Essex North District Medical Society will be held Wednesday, May 11, at Andover Academy, dinner at Phillips Inn, talking movies.

E. S. BAGNALL, Secretary.

Essex South District Medical Society

May 5, Thursday—Censors' Meeting, Salem Hospital, 3:30 P.M.

May 10, Tuesday—Annual Meeting. The Tavern, Gloucester. Speaker and subject to be announced later. Ladies invited.

Franklin District Medical Society

May 10—Meeting at the Weldon, Greenfield, at 11 A.M.

CHARLES MOLINE, Secretary.

Middlesex East District Medical Society

May 11—Meeting to be held at the Towanda Club, Woburn, at 1 P.M. The speaker will be Dr. Samuel R. Meaker, Boston. Subject to be announced.

Middlesex South District Medical Society

April 28—See page 873, issue of April 21.

Norfolk District Medical Society

May—Annual Meeting, date and place to be announced.

May 5—Censors' Meeting for examination of candidates, Roxbury Masonic Temple, 171 Warren Street, Roxbury, 4 P.M. Fee $10.00 payable at time of examination. All candidates will have applications in the hands of the secretary one week prior to this date. All candidates from Medical Schools not on approved list of Society must have application complete two weeks prior to date of examination.

F. S. CRUICKSHANK, Secretary.

Norfolk South District Medical Society

May 5—Annual Meeting at 12 o'clock noon, at the Norfolk County Hospital, South Braintree. Censors will meet on May 5 at 11:15 A.M. at the Norfolk County Hospital.

N. R. PILLSBURY, Secretary.

Suffolk District Medical Society

May 5—The Censors will meet for the examination of candidates at the Medical Library, No. 8 The Fenway, Thursday, May 5, 1932, at 4:00 o'clock.

Candidates should make personal application to the Secretary, and present their medical diploma at least one week before the examination.

LELAND S. McKITTRICK, M.D., Secretary.
205 Beacon Street, Boston.

Worcester District Medical Society

Wednesday afternoon and evening, May 11—Annual Meeting. Program to be announced later.

ERWIN C. MILLER, Secretary.

BOOK REVIEWS

Thomas Lodge, The History of an Elizabethan. By N. BURTON PARADISE. New Haven, 1931. x + 254 pages.

Professor Paradise of the English Department in Yale University has written an account of the life of Thomas Lodge, an Elizabethan who is principally remembered on account of his play, "Rosalynde" (1590), which was used as a basis for Shakespeare's "As You Like It." Thomas Lodge also had an adventurous career and, in addition, practised medicine for a good many years in London. He was born about 1558, graduated at Oxford in 1577, studied law at Lincoln's Inn for five or six years, voyaged as an adventurer with Sir Richard Greenvile to Virginia in 1585, returned to London, where he wrote a number of plays and pamphlets, and later went on a second adventure, in 1591, with Thomas Cavendish to Brazil. The voyage ended disastrously; Cavendish died, but in some manner not quite known, Lodge survived and found his way back to England. He studied medicine in Avignon (1597-99) and for the last thirty years of his life practised medicine in London. He is said to have been "able, busy and prosperous". He was an ardent Roman Catholic and his practice was largely with the Catholic laymen in and about London. His only medical publication is a "Treatise on the Plague" (1603), which gives a fairly good account of the plague as it appeared in London during Lodge's lifetime.

Professor Paradise's account of Lodge is interesting, although Lodge was not a great physician nor was he an important power in the medical world. He is remembered more for his influence on English literature.

The Wisdom of the Body. BY WALTER B. CANNON, M.D., Sc.D., LL.D. New York: W. W. Norton & Co., Inc. 1932. 312 pages. Price $3.50.

Dr. Cannon has written an excellent book, semi-popular in tone but based on sound physiological data. Much of the theme of this publication has appeared in previous scientific contributions from the Harvard Physiological Laboratory, particularly the article in *Physiological Reviews* for 1929 on "Organization for Physiological Homeostasis." This work is now presented for the general reader. In the main, it pertains to the relation of the autonomic nervous system to the self-regulation of physiological processes. The chief function of the autonomic system is to maintain steady states within the body, a situation which Dr. Cannon has called "homeostasis". He offers evidence for this in the constancy of the fluid matrix of the body, the water and salt content of the blood, and the stability of sugar, proteins, fats and calcium in the same fluid. In addition, he points out the mechanisms for maintaining an adequate oxygen supply and for keeping the body temperature within small limits.

It is a difficult task to present actual chemical and physiological facts so that they can be easily understood by the general reader. It may be said that Dr. Cannon has succeeded in part, although for a man without scientific training there would be considerable difficulty in interpreting the kymographic drawings, charts showing mathematical graphs and the numerous chemical formulae with which the book abounds. There is much of interest, however, for a physician who has failed to keep in touch with recent physiological investigation and as such the book can be highly recommended.

Traité de Physiologie Normale et Pathologique. Volume II: *Alimentation et Digestion.* Published under direction of G. H. ROGER and LÉON BINET. Paris, Masson et Cie., 1931. 565 pages. Illustrated. Price 80 fr.

This volume belongs to series of eleven designed to constitute an encyclopedic summary of the science. The editors are MM. Roger and Binet, the contributors collaborating number about 110. Fifteen of these have participated in the making of the book at hand for review. The activity exercised in keeping the work up to date is indicated by the fact that while several of the volumes have not yet appeared two of them are soon to be published in Second Editions.

The subject of Nutrition is covered quite fully and in general the division of space among the subheadings seems well considered. The section on Vitamines appears scant and extremely conservative. Throughout the book one finds the older, classical researches emphasized. This is not necessarily a fault: it is a common error to underestimate the fullness and value of earlier studies. If every recent work of importance fails of recognition the policy of frequent revision promises to correct the deficiency. The bibliography is moderately extensive; it will probably be more serviceable to the average student than if it were exhaustive: the writers have exercised a critical faculty which works to their advantage. The French text is singularly easy to read. The separation of the matter into paragraphs with informing captions makes the book convenient for use as a source of data. It will be constantly resorted to in the library.